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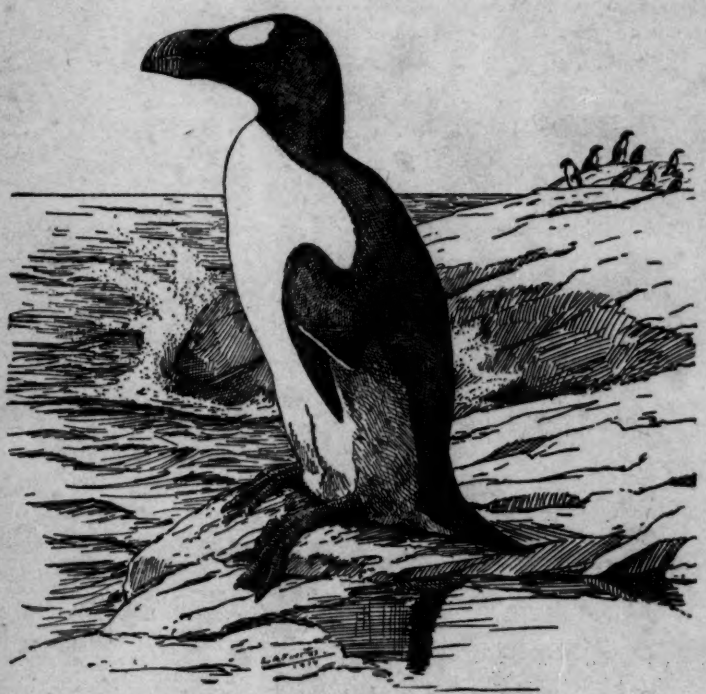

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GENUS EUPSYCHORTYX

THE AUK:

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A REVISION OF THE GENUS EUPSYCHORTYX.

BY W. E. CLYDE TODD.

Plates V–VI.

INTRODUCTION.

WHEN, some three years ago, the writer had occasion to take up for identification the gradually increasing series of South American Crested Quails in the collection of the Carnegie Museum, he experienced great difficulty in reaching definite conclusions. Discrepancies were evident between the specimens in hand and the published descriptions consulted, and it soon became apparent that the group was sadly in need of revision. Preliminary studies made at that time resulted in the publication of two forms believed to be new. More recently he has been led to take up the whole matter afresh in connection with a new faunal study of the birds of the Santa Marta region of Colombia. For various reasons it has seemed desirable to present the results of this particular investigation in a separate paper, and to go into the subject in more detail than would otherwise be permissible, the more so in view of the fact that the status of the newly described forms has recently been questioned, and that there still seems to be a great deal of uncertainty regarding the relationships and nomenclature of the older forms as well. Such a study has been made possible only through the courtesy of other institutions and individuals in the loan of material, and I have to thank the authorities of

The American Museum of Natural History, the U. S. National Museum, the Museum of Comparative Zoology, the Museum of the Brooklyn Institute, the Academy of Natural Sciences of Philadelphia, and Mr. James H. Fleming, of Toronto, Ontario, for favors extended. No less than one hundred and ninety-two specimens have been examined, including considerable typical and topotypical material, and a representation of all the known forms. My acknowledgments are also due to Mr. George M. Sutton for the very excellent painting which forms the basis of the plate which accompanies this paper, and for plotting both of the maps illustrating the distribution of the various forms. None of the references appearing in the paper have been taken at second-hand, and I have to thank Mr. E. W. Nelson, Dr. Harry C. Oberholser, and Dr. Charles W. Richmond for verifying a few of those here quoted. All measurements are in millimeters, and the length of the bill is that of the exposed culmen. Free use has been made of Mr. Ridgway's 'Color Standards and Color Nomenclature' in preparing descriptions.

Genus **Eupsychortyx** Gould.

Eupsychortyx GOULD, Mon. Odontophorinæ, 1850, 15 (diag.; list of species; no type designated).—GRAY, Cat. Genera and Subgenera Birds, 1855, 107 (*Tetrao cristatus* Linnæus designated as type).—GRAY, Hand-List Birds, II, 1870, 273 (list of species).—GIEBEL, Thes. Orn., II, 1875, 141 (diag.; list of species).—WATERHOUSE, Index Genera Avium, 1889, 78 (ref. orig. diag.).—OGILVIE-GRANT, Cat. Birds Brit. Mus., XXII, 1893, 99, 407 (diag.; *E. leucopogon* given as type).—SHARPE, Hand-List Birds, I, 1899, 45 (list of species).—DUBOIS, Syn. Avium, II, 1907, 819 (list of species).—SALVIN and GODMAN, Biol. Centr.-Am., Aves, III, 1903, 295 (diag.; references).—KNOWLTON, Birds of the World, 1909, 296 (range).—CHAPMAN, Bull. Am. Mus. Nat. Hist., XXXVI, 1917, 173, in text (crit.).

Eupsichortyx (emendation) BONAPARTE, Compt. Rend., XLII, 1856, 883 (list of species).

The first species of this group to receive a binomial name was the *Tetrao cristatus* of Linnæus, 1766, based on Brisson. Curiously enough, the true habitat of this form remained unknown

up to 1892, when the late Count von Berlepsch received it from Curaçao, one of the Dutch West Indies, and it has since been traced to the mainland. The Guiana bird was at first supposed to be the same, but in 1815 Temminck distinguished it under the name *Perdix sonnini*, although as late as 1892 we find von Berlepsch arguing the question. In 1830 Vigors described two supposed new quails as *Ortyx affinis* and *Ortyx neoxenus*, but it is practically certain that these names refer to the same species already named by Temminck and Linnæus respectively. In 1842 Lesson described a bird from "San Carlos in Central America" as *Ortyx leucopogon*, and the following year Gould followed with the description of *Ortyx parvicristatus* and *Ortyx leucotis* from Colombia. Specimens were few and far between at this time, as Gould discovered when he undertook to bring together material for his work on the Odontophorinæ or American Partridges, which appeared in 1850. In this work Gould proposed to split up *Ortyx*, which had superseded *Perdix* as the generic designation of the American Quails, into several generic groups. He placed the five accepted forms above mentioned in his new genus *Eupsychortyx*, together with the *Ortyx affinis* of Vigors, which he considered doubtful.

In 1855, J. E. Gray designated *Tetrao cristatus* Linnæus as the type of *Eupsychortyx*. Later authors have, as a rule, accepted the genus without question, while Mr. Ogilvie-Grant, who was the next author to deal critically with the group, enlarged it to include two Central American forms that had heretofore been referred to *Ortyx*, namely, *O. leylandi* Moore and *O. nigrogularis* Gould, including here also *Eupsychortyx hypoleucus*, described by Gould in 1860. Salvin and Godman also adopted the same limits in the "Biologia Centrali-Americana." Very recently Dr. Chapman has sought to merge *Eupsychortyx* with *Colinus* (the equivalent of the old *Ortyx*), and there is certainly much to be said in favor of his views, so much, indeed, that the present writer finds himself in full accord with the principles there laid down. In practice, howe ver, so long as we recognize so many other generic groups with no better characters, we are justified in provisionally recognizing *Eupsychortyx*, at least until such time as a consistent scheme for evaluating generic groups can be devised. But even with this

Fig. 1. Distribution of *Eupsychortyx* ● *E. s. sonnini*, ◑ *E. s. mocquerysi*, ⊙ *E. c. cristatus*, ○ *E. c. horvathi*.

understanding *Eupsychortyx* can only be recognized by restricting it to the forms occurring from Panama southward, in which the crest (when fully developed) is longer than the head and slightly recurved at the tip. The relative length of the first primary, upon which Mr. Ogilvie-Grant lays so much stress, unfortunately does not correspond with the character of the crest. As a matter of fact *Ortyx leylandi* Moore, *Ortyx nigrogularis* Gould, and *Eupsychortyx hypoleucus*[1] Gould agree much better with the type of *Colinus* (*C. virginianus*) than with *Eupsychortyx* as here restricted, all three having the short, decumbent crest of the former.

The close relationship existing among the various forms of this group is indicated by the general agreement in their style of coloration, and in particular by the close resemblance of the females, which are sometimes difficult to discriminate. Three specific types, depending for their characters on the color of the throat, and superciliary and malar stripes, and the spotted condition of the breast, can be discriminated. The distribution of these three types seems as a rule to be sharply defined by mountain ranges, which they appear unable to pass, being birds of the Tropical or Subtropical Zone. Thus, *E. sonnini* enjoys an extensive range in Guiana and Venezuela, but is abruptly stopped by the Andean chain in Venezuela and Colombia. In the region around the Lake of Maracaibo, in the pocket between the Andes of Meridá and the Eastern Andes of Colombia, we find the second type, *E. cristatus*. In the valleys of the Andean region, and extending into the low country as far even as western Panama, a third type, *E. leucopogon*, occurs. All three of these types are subject to more or less geographic variation, while individual variation is excessive. A most interesting problem is presented in the case of *E. leucopogon* and *E. cristatus*, the respective ranges of which appear to approximate each other very closely, possibly overlapping. The possibility that *E. cristatus* and *E. sonnini* may also meet and intergrade in some restricted area in Venezuela is likewise to be considered. The phylogeny of the group will be more fully discussed, we hope, by the eminent authority to whom we are looking for an exhaustive study of the genus *Colinus*.

[1]The only doubt in this case is with regard to this form, of which I have been able to examine but one male specimen.

Suffice it to say here that I regard *E. sonnini* as the primitive form.

Between the views of the latest writer, who would reduce all the described forms of this group to subspecies of *E. cristatus*, and those of previous authors, who retain them as distinct species, there would seem to be room for a safe and sane arrangement which will better express their real affinities. The results of my study of the group may be expressed in tabular form in the following:

Key to the Species and Subspecies of Eupsychortyx.

Based on Adult Males Only.

A. Breast plain.
  a. Above darker, crest shorter. *Eupsychortyx sonnini sonnini.*
  a′. Above paler, crest longer. *Eupsychortyx sonnini mocquerysi.*
A′. Breast spotted with white.
  a. Superciliary and malar stripes amber brown.
    b. Superciliary stripe without black spots or streaks intermixed.
      c. White of head more extended, occupying anterior half of throat; breast less heavily spotted with white. *Eupsychortyx leucopogon leucopogon.*
      c′. White of head more restricted, occupying chin, lores, and subloral region only; breast more heavily spotted with white. *Eupsychortyx leucopogon leucotis.*
    b′. Superciliary stripe with spots or streaks of black.
      c. Coloration deeper and richer, the breast almost or quite as deeply colored as the throat. *Eupsychortyx leucopogon decoratus.*
      c′. Coloration duller and paler, the breast conspicuously paler than the throat. *Eupsychortyx leucopogon littoralis.*
  a′. Superciliary and malar stripes black.
    b. Upper parts darker, more rufescent. *Eupsychortyx cristatus cristatus.*
    b′. Upper parts paler, more grayish. *Eupsychortyx cristatus horvathi.*

Eupsychortyx sonnini sonnini (Temminck).

Plate V, figures 1–2.

"Coturnix eleganter variegata, & cristata" BARRERE, Essai sur l'histoire naturelle de la France equinoxiale,[2] 1741, 129 (French Guiana; descr., etc.).

[2]This title, however, did not appear until the second edition came out in 1749.

"Coturnix fronte sordide albicante" ROZIER, Journ. de Physique, II, i, 1772, 217, pl. 2 ([French] Guiana; descr.).

"Caille de Cayenne" VIREY, in BUFFON, Hist. Nat. Ois., Sonnini ed., VII, 1802, 133 (French Guiana; descr.; habits).

Perdix sonnini TEMMINCK, Hist. Nat. et Gén. Pigeons et Gallinaces, III, 1815, 451 (French Guiana; orig. descr.; type in Paris Mus.; habits, etc.), 737 (diag.; references).—VIEILLOT, Nouv. Dict. d'Hist. Nat., XXV, 1817, 246 (descr.; habits).—VIEILLOT, Tabl. Enc. et Méth., I, 1820, 369 (descr.; habits).—TEMMINCK, Pl. Col., V, 1823, pl. 75 and text (descr.; habits).

Ortyx sonninii STEPHENS, in Shaw's Gen. Zool., XI, 1819, 383 (descr.; habits; references).—JARDINE and SELBY, Ill. Orn., I, 1828, text to pl. 38 (diag.; range; references).—LESSON, Ill. Zool., I, 1831, text to pl. 52 (diag.; range).—GRAY, List Spec. Birds Brit. Mus., III, 1844, 44 (British Guiana; references).—GRAY, Gen. Birds, III, 1846, 514 (in list of species; references).—REINHARDT, in NEWTON, Ibis, 1861, 114 (crit.).—GRAY, List Spec. Birds Brit. Mus., V, 1867, 77 (British Guiana; references).—VON PELZELN, Orn. Brasiliens, iii, 1870, 290 (Forte do S. Joaquim, Rio Branco, Brazil), lv. (faunal range).—GRAY, Hand-List Birds, II, 1870, 273 (range).

"Sonnini's Quail" LATHAM, Gen. Hist. Birds, VIII, 1823, 328 (descr.; references).

(?)*Ortyx affinis* VIGORS, Proc. Com. Sci. and Cor. Zool. Soc. London, 1830, 3 ("Mexico"; orig. descr.; type in coll. ?).—GRAY, Gen. Birds, III, 1846, 514 (in list of species; ref. orig. descr.).—REINHARDT, in NEWTON, Ibis, 1861, 115 (crit.).

Colinus sonninii LESSON, Traité de Orn., 1831, 508 (in list of species; range).

Ortyx parvicristatus GOULD, Proc. Zool. Soc. London, 1843, 106 ("Bogotá," Colombia; orig. descr.; type in coll. Brit. Mus.).—GRAY, List Spec. Birds Brit. Mus., III, 1844, 44 ("S. Am."; ref. orig. descr.).—GRAY, Gen. Birds, III, 1846, 514 (in list of species; references).—GRAY, Hand-List Birds, II, 1870, 273 ("Bogotá," Colombia, in range).

Ortyx cristatus (not *Tetrao cristatus* Linnæus) CABANIS, in SCHOMBURGK, Reisen in Britisch-Guiana, III, 1848, 747 (British Guiana; habits).—BROWN, Canoe and Camp Life in British Guiana, 1876, 268 (Cotinga River and Rupununi Savannas, British Guiana).

(?)*Eupsychortyx affinis* GOULD, Mon. Odontophorinæ, 1850, 16 (descr.; crit.; Vigors' record).

Eupsychortyx sonninii GOULD, Mon. Odontophorinæ, 1850, pl. 11 and text (descr.; syn.; range—"Guiana, Caraccas, and the southern provinces of Mexico").—NEWTON, Ibis, 1860, 308 (St. Thomas, West Indies).—CASSIN, Proc. Acad. Nat. Sci. Philadelphia, 1860, 378 (St. Thomas, West Indies).—SCLATER and SALVIN, Proc. Zool. Soc. London, 1869, 252 (Plain of Valencia, Venezuela).—SCLATER and SALVIN, Nom. Avium Neotrop., 1873, 138 (in list of species; range).—GIEBEL, Thes.

Orn., II, 1875, 142 (Gould's reference).—HEINE and REICHENOW Nom. Mus. Heineani Orn., 1887, 294 ("South America").—CORY, Auk, IV, 1887, 225 (St. Thomas, West Indies; references; crit.).—CORY, Birds W. Indies, 1889, 224 (St. Thomas, West Indies; descr.; references).—CORY, Cat. W. Indian Birds, 1892, 96 (St. Thomas, West Indies).—VON BERLEPSCH, Journ. f. Orn., XL, 1892, 99, in text (French Guiana; Quonga, British Guiana; crit.).—OGILVIE-GRANT, Cat. Birds Brit. Mus., XXII, 1893, 409 (Forte do Rio Branco, Brazil; Quonga, British Guiana; Caracas, Venezuela; Mustique I., Grenadines; syn.; descr.).—HARTERT, Ibis, 1893, 306, in text, 338, note (range; crit.).—HARTERT, Bull. Brit. Orn. Club, III, 1894, 37, in text (Plain of Valencia, Venezuela).—HARTERT, Ibis, 1894, 430, in text (Plain of Valencia, Venezuela).—HARTERT, Nov. Zool., I, 1894, 675, in text (crit.).—PHELPS, Auk, XIV, 1897, 367 (Cumanacoa and San Antonio, Venezuela).—OGILVIE-GRANT, Hand-Book Game-birds, II, 1897, 130 (syn.; descr.; range).—SHARPE, Hand-List Birds, I, 1899, 45 (range).—OGILVIE-GRANT, Ibis, 1902, 239 (Quonga, British Guiana; Mustique I., Grenadines; crit.).—DUBOIS, Syn. Avium, II, 1902, 820 (references; range).—VON BERLEPSCH and HARTERT, Nov. Zool., IX, 1902, 121 (Altagracia, Venezuela; range; crit.), 275 (St. Thomas, West Indies).—HAGMANN, Bol. Mus. Gœldi, IV, 1904, 302 (von Pelzeln's reference).—CLARK, Proc. Boston Soc. Nat. Hist., XXXII, 1905, 246 (St. Vincent and Mustique I., West Indies).—VON IHERING, Aves do Brazil, 1907, 17 (range—"Rio Branco e Rio Negro," Brazil).—PENARD, Vogels van Guyana, I, 1908, 310 (descr.; range; habits).—VON BERLEPSCH, Nov. Zool., XV, 1908, 296 (Cayenne, French Guiana, *ex* Sonnini; British Guiana, *fide* Whiteley).—CORY, Field Mus. Orn. Series, I, 1909, 239, in text (British Guiana and Caracas, Venezuela, crit.).—BRABOURNE and CHUBB, Birds S. Am., I, 1912, 13 (ref. orig. descr.; range).—CHERRIE, Mus. Brooklyn Inst. Sci. Bull., II, 1916, 357 (lower Orinoco River, Venezuela).—CHUBB, Birds Brit. Guiana, I, 1916, 31 (Takutu Mountains, Abary River, and Great Savannas, British Guiana; descr.; range; habits).

Eupsychortyx parvicristatus GOULD, Mon. Odontophorinæ, 1850, pl. 12 and text (descr.; range; crit.).—SCLATER, Proc. Zool. Soc. London, 1855, 163 ("Bogotá," Colombia).—SCLATER and SALVIN, Nom. Avium Neotrop., 1873, 138 (in list of species; range).—VON PELZELN, Ibis, 1875, 331 ("Spanish Guiana").—GIEBEL, Thes. Orn., II, 1875, 142 (Gould's reference).—HEINE and REICHENOW, Nom. Mus. Heineani Orn., 1887, 294, part ("Bogotá," Colombia).—OGILVIE-GRANT, Cat. Birds Brit. Mus., XXII, 1893, 410 ("Bogotá," Colombia; syn.; descr.; crit.).—OGILVIE-GRANT, Hand-Book Game Birds, II, 1897, 131 (syn.; descr.; range).—SHARPE, Hand-List Birds, I, 1899, 45 (range).—DUBOIS, Syn. Avium, II, 1902, 820 (references; range).—VON BERLEPSCH and HARTERT, Nov. Zool., IX, 1902, 121, in text (crit.).—BRABOURNE and CHUBB, Birds S. Am., I, 1912, 13 (ref. orig. descr.; range).

DISTRIBUTION OF EUPSYCHORTYX IN COLOMBIA

● *E. leucopogon leucotis*, ⊙ *E. l. decoratus*, ○ *E. l. littoralis*.

Eupsichortyx sonninii BONAPARTE, Compt. Rend., XLII, 1856, 883 (in list of species).

Eupsichortyx parvicristata BONAPARTE, Compt. Rend., XLII, 1856, 883 (in list of species).

Ortyx parvirostris (lapsus) GRAY, List Spec. Birds Brit. Mus., V, 1867, 77 ("Bogotá," Colombia; references).

Eupsychortyx cristatus (not *Tetrao cristatus* Linnæus) SALVIN, Ibis, 1886, 175 (Cabanis' British Guiana reference).—(?) HEINE and REICHENOW, Nom. Mus. Heineani Orn., 1887, 294, part ("Guiana").

Odontophorus sonnini GŒLDI, Aves do Brazil, ii, 1894, 439 (Rio Branco, Brazil).

Eupsychortyx [*sonnini*] FERRY, Condor, X, 1908, 226 (Caracas, Venezuela; habits).

Colinus cristatus parvicristatus CHAPMAN, Bull. Am. Mus. Nat. Hist., XXXVI, 1917, 199 (Fómeque and Quetame, Colombia; range; crit.).

Description.—Male: forehead, lores, and crown varying from soiled white to buffy or grayish brown, the crest similar but usually darker; broad superciliaries, beginning above the eye, amber brown, margined above by a narrow and irregular line of black; auriculars hair brown or drab; nape ochraceous tawny, varied with black bars on the feathers; throat amber brown; neck all around with a collar of black and white and chestnut spots, this collar broadest on the sides of the neck, where it is produced forward to the auriculars; upper parts varying from auburn to bister or sepia, tinged more or less with grayish, vermiculated with black and irregularly mottled with black and brown; tertiaries and scapulars similar but more boldly marked, the feathers with buffy margins, giving a streaked appearance; tail mouse gray or hair brown, or even dusky, indistinctly barred and mottled with whitish or buffy; wings hair brown, the secondaries mottled with buffy or grayish on the outer webs, the upper coverts colored like the back; under wing-coverts hair brown, margined and tipped with white; breast russet, tinged with grayish, nearly or quite immaculate, but showing faint and irregular dusky vermiculations, especially laterally; rest of under parts chestnut or amber brown, passing into buffy posteriorly, everywhere spotted with white, each spot surrounded (except on the outer margin) with black; under tail-coverts white or buffy white, sometimes tinged with ochraceous, with notched black shaft-streaks; "iris brown; bill black; feet pale horn color" (Carriker).

Female similar in general to the male, but head and under parts different; forehead, crown, and crest much darker, brown or nearly black, the nape similar, varied with ochraceous; superciliaries and throat raw sienna to ochraceous tawny, the throat spotted or streaked, more or less heavily, with black; neck-collar of black and white spots almost obsolete in front; spots on the under surface beginning close up to the throat on

the breast, which is fawn color or wood brown at first; centers of the feathers of the sides and flanks tinged with Brussels brown or antique brown.

Measurements.—Male (ten specimens) wing, 96–106 (average, 102); tail, 57–67 (62); bill, 12–13 (12.7); tarsus, 25–30 (27.5). Female (six specimens); wing, 95–99 (97); tail, 58–62 (60); bill, 12–13 (12.5); tarsus, 25–28 (26).

Range.—From Guiana and extreme northern Brazil to Venezuela (except the Cariaco Peninsula) and Colombia, east of the Andes.

Remarks.—The earliest mention of this species which I can trace is that by Pierre Barrere, who refers to it in his work on the natural history of French Guiana, published in 1741. The Abbé Rozier gave a brief and rather unsatisfactory description of it in 1772, but in 1802 a signed article by Virey appeared in Sonnini's edition of Buffon's "Histoire Naturelle de Oiseaux," giving a much fuller account of the bird as observed in French Guiana. It was formally described by Temminck under a binomial name in 1815, from specimens said by him to have been given to the Paris Museum, where presumably they still are. Vieillot, Latham, and the other authors of that time apparently knew the species only from these earlier sources, which they usually quote. Early in 1830 Vigors described a quail from an unknown locality under the name *Ortyx affinis*, and Gould another from Colombia in 1843 as *Ortyx parvicristatus*. This brings us down to 1850, the year when Gould's "Monograph of the Odontophorinæ" appeared. In this work Gould figured and described both *sonnini* and *parvicristatus*, referring them to his new genus *Eupsychortyx*, but did not consider it necessary to figure *affinis*, regarding it as too close to *sonnini*. Subsequent authors have accepted both *sonnini* and *parvicristatus* mainly on Gould's authority, as one after another records began to come in from British Guiana, Venezuela, and even as far south as Brazil. All these were duly referred to *sonnini* (although sometimes with misgivings), except that Cabanis, possibly by inadvertence, confused the British Guiana bird with *cristatus*.

It would appear that up to the time of Dr. Chapman's recent explorations in Colombia no specimens from that country with authentic data were available, the alleged species *parvicristatus* being known only from so-called "Bogotá" skins. Indeed, his

collectors failed to secure any specimens whatever, although they saw a flock at Quetame probably belonging to this species, and the two skins with a definite locality attached which he records were secured through another party. More recently Mr. M. A. Carriker, Jr., has sent in three fine specimens from Palmar, in the State of Boyaca. Equipped with this material, I must confess my inability to distinguish the Colombian bird from that of Venezuela and Guiana, all the characters mentioned by Gould, and relied on by Messrs. Ogilvie-Grant and Chapman to separate it therefrom reappearing again and again in the latter series. The comparative shortness and bluntness of the feathers of the crest is a very elusive character indeed, depending as it does considerably upon the state of wear, but I am able to match the Colombian specimens very closely by certain individuals from elsewhere, and under such circumstances cannot see my way clear toward recognizing *parvicristatus* even as a subspecies, as has been suggested by Messrs. von Berlepsch and Hartert. But while geographic variation seems thus to be *nil*, the amount of individual variation that obtains is astonishing, and makes it difficult to frame a description which will fit all specimens in every particular. The phase described above is what may from its frequency be considered the normal one. The general tone of the upper parts, however, varies greatly, perhaps to some extent according to season, some specimens being deeply rufescent, other more brownish by comparison, and others still paler, more grayish. The forehead and crest also vary considerably in exact shade of color, but it is in the color of the throat that the variation is greatest. Normally the throat is plain amber brown, but in some specimens it is pure white, and in others white, shaded with ochraceous laterally, and spotted with black medially. In extreme cases it is amber brown, interrupted by a median band of black-tipped white feathers. It was obviously a bird of this sort which formed the basis of the description of *Ortyx affinis* Vigors. What the significance of these variations may be I cannot say; they occur in examples coming from the same localities as normal individuals, with which they are connected by intermediates. In any case it is very doubtful if age has anything to do with the matter.

Another variable feature is the extent and character of the spotting below. In some specimens the spots are well developed on the chest, while in others from the same locality the chest is almost as immaculate as the breast. In some examples the dark markings below assume the form of bars. In what appear to be younger birds the breast is much paler, more like that of the female, while the chest and abdomen are tinged with buffy. Mr. Ogilvie-Grant describes a "quite young bird" as having "the upper parts very similar to those of the female adult, but all the feathers of the mantle, wing-coverts, scapulars, and chest have pale buff shaft-stripes; chin and throat white, rest of the under-parts white irregularly barred with black." The youngest bird examined by me shows traces of this plumage; it has broad black and brown shaft-streaks on the sides. The female of this species may be distinguished from that of the others of this group by the color of the under parts, there being a band of fawn color or wood brown, more or less decided, on the breast just below the neck-band, varied with a few small white spots or dark markings; the variation in exact shade and pattern is considerable, however. A female from Naguanagua (near La Cumbre de Valencia), Venezuela (No. 35,163, Collection Carnegie Museum), is so very peculiar that it can only be referred to *sonnini* provisionally, on geographical grounds mainly. It lacks the breast-band entirely, this part being barred irregularly with plain brownish black and white; the throat is squamate rather than streaked.

The capture of several specimens of this quail in the Serra da Lua, near Boa Vista, on the Rio Branco, northern Brazil, by Messrs. M. P. Anderson and R. H. Becker, working in the interest of the Field Museum of Natural History, appears to constitute the most southerly record for the species. These specimens so far as I can see are not essentially different from those coming from other sections. The Carnegie Museum possesses a nice series of ten specimens from the region south of Lake Valencia in Venezuela, where the species is said to be common. It has been introduced into St. Thomas, St. Vincent, Mustique, and probably other islands of the Lesser Antilles. Its range to the west appears to be strictly limited by the Andes of Meridá in Venezuela and by the Eastern Andes in Colombia. Schomburgk

states that in British Guiana the species occurs in flocks of from twelve to eighteen individuals in the oases of the savannas, outside of which it rarely ventures far, running or flying into the woods upon being disturbed. The late John F. Ferry, who met with the bird near Caracas, Venezuela, says that he flushed a covey among the forlorn, bushy hills of that section, where they darted off and sought safety in a patch of the densest shrubbery. Returning a few days later he again flushed them in the same spot and succeeded in securing a specimen. "All their habits that I observed were typically quail-like."

Specimens examined.—Colombia: "Bogotá," 2; Fómeque, 2; Palmar, Boyaca, 3. Venezuela: Caracas, 4; Naguanagua, 1; El Trompillo, Carabobo, 10; San Antonio, Bermudez, 1; Agua Salada de Ciudad Bolivar, 3; Altagracia, 2; San Mateo de Caicara, 1; Maripa, Rio Caura, 6; San German de Upata, 1. British Guiana: Courantyne River, 2. Dutch Guiana: "Surinam," 1; Paramaribo, 1; "Guiana," 1. Brazil: Serra da Lua, near Boa Vista, 5. West Indies: St. Thomas, 3. Unspecified, 4. Total, 53.

Eupsychortyx sonnini mocquerysi Hartert.

Plate V, figure 3.

Eupsychortyx sonnini (not *Perdix sonnini* Temminck) CASSIN, Proc. Acad. Nat. Sci. Philadelphia, 1860, 378, part (Cumaná, Venezuela).—OGILVIE-GRANT, Ibis, 1902, 239, part (Margarita I., Venezuela, *ex* Richmond).

Eupsychortyx mocquerysi HARTERT, Bull. British Orn. Club, III, 1894, 37 (Cumaná, Venezuela; orig. descr.; type in coll. Tring Mus.)—HARTERT, Ibis, 1894, 430 (reprint orig. descr.).—HARTERT, Nov. Zool., I, 1894, 675, pl. 15, fig. 2 (Cumaná, Venezuela; crit.).—OGILVIE-GRANT, Hand-Book Game-Birds, II, 1897, 131 (syn.; descr.; range).—SHARPE, Hand-List Birds, I, 1899, 45 (ref. descr.; range).—DUBOIS, Syn. Avium, II, 1902, 820 (references; range).—BRABOURNE and CHUBB, Birds S. Am., I, 1912, 13 (ref. orig. descr.; range).

Eupsychortyx pallidus RICHMOND, Proc. U. S. Nat. Mus., XVIII, 1896, 657 (Margarita I., Venezuela; orig. descr.; type in coll. U. S. Nat. Mus.; habits, *ex* Robinson).—SHARPE, Hand-List Birds, I, 1899, 45 (ref. orig. descr.; range).—CLARK, Auk, XIX, 1902, 260 (Margarita I., Venezuela; habits).—LOWE, Ibis, 1907, 551 (Margarita I., Venezuela; crit.).—LOWE, Ibis, 1909, 322 (Cariaco Peninsula, Venezuela).—KNOWL-

TON, Birds of the World, 1909, 296 (Margarita I., Venezuela; habits, *ex* Robinson).—CORY, Field Mus. Orn. Series, I, 1909, 238 (Mocanao and Boca del Rio, Margarita I., Venezuela; meas.; crit.).—BRABOURNE and CHUBB, Birds S. Am., I, 1912, 13 (ref. orig. descr.; range).

Eupsychortyx sonnini var. *paltida* DUBOIS, Syn. Avium, II, 1902, 829 (ref. orig. descr.; range).

Subspecific characters.—Male: similar to that of *Eupsychortyx sonnini sonnini*, but upper parts paler, spotting of under parts purer white, and crest paler and longer. Female generally paler, more grayish, less brownish above than in *sonnini*, and rather whiter, less buffy below.

Measurements.—Male (seven specimens): wing, 99–105 (average, 101); tail, 57–69 (60); bill, 12.5–13.5 (13); tarsus, 26–29 (28). Female (five specimens): wing, 101–104 (102.5); tail, 61–64 (62); bill, 12–13.5 (13); tarsus, 26–28 (27).

Range.—Cariaco Peninsula, extreme northeastern Venezuela, and outlying island of Margarita.

Remarks.—When Dr. Richmond described the Margaritan bird as a distinct species in 1896 he had but three specimens for comparison with two unsatisfactory examples of *sonnini;* nevertheless, it was "considered desirable to separate the two forms on the evidence presented, and on the fact that at least two other species (*Doleromya* and *Speotyto*) characteristic of the cactus thickets are pale representatives of mainland birds." Mr. Cory in 1909, with more and better material before him of the insular bird, but still with a very inadequate representation of true *sonnini*, was at some pains to point out the variations observable in his series, which, however, he says are distinctly the reverse of being paler than mainland specimens, and he is inclined to attribute the color of the type of *pallidus* to season. Dr. Percy R. Lowe, who visited Margarita in 1904, refers to the pale coloration of examples from that island, and on comparing the series collected there by Messrs. Robinson, Clark, and Ferry with another from the mainland of Venezuela it is obvious that the former are paler, although individual specimens might be hard to distinguish. The type of *pallidus* is merely an unusually pale individual. Small as it is, the series runs through precisely the same set of variations with regard to the color of the throat as does the typical form, some having the throat Sudan brown, others white, and still others mixed black and white or ochraceous. In the white-throated specimens (*cf.* Plate V, figure 3) the forehead and

sides of the head are mainly white or buffy white; they thus correspond to the description and figure of *Eupsychortyx mocquerysi* Hartert, described from Cumaná, on the mainland opposite Margarita Island. It is fair to presume that this is the same bird, and the name having two years' priority will have to supersede *pallidus* of Richmond. Dr. Lowe, indeed, refers specimens from the Cariaco Peninsula to the latter without comment, and it is worthy of note that the faunal conditions here are precisely the same as on Margarita. Under these circumstances I fail to see how we can avoid accepting Dr. Hartert's name, based on the white-throated phase, for the insular as well as the Cumaná birds.

In view of the extensive range of *sonnini* and the large amount of individual variation to which it is subject, it is somewhat surprising to find a geographical variant with such a restricted distribution. Evidently the excessive aridity of its habitat has operated to produce pallor, as in the case of several other species similarly affected. Lieutenant Robinson writes as follows concerning its habits as observed by him: "These handsome birds were abundant in the thorny thickets near the coast, but none were seen in the interior of the island. They ran through the cactus undergrowth with incredible swiftness and it was a difficult matter to cause them to take wing. The call of the male is identical with that of our common bob-white, and the call of the scattered members if a covey is also the same. The native name is 'perdiz.'" Mr. Clark found the bird "common along the bases of the hills, and in the scrub on their lower slopes." The late Mr. Ferry found it "in abundance at Mocanao, the peninsula at the west end of the island, and in riding along the cactus-covered plains from Boca del Rio (south-central part of the island) we saw several flocks."

Specimens examined.—Venezuela: Margarita Island, 11; El Vallé, Margarita Island, 1. Total, 12.

Eupsychortyx leucopogon leucopogon (Lesson).

Plate V, figure 4.

Ortyx leucopogon LESSON, Rev. Zool., 1842, 175 ("San Carlos," Central America; orig. descr.; type in coll. Paris Mus.[?]).—DES MURS, Icon. Orn., 1846, text to pl. 36 (descr.; range).—GRAY, Gen. Birds, III, 1846,

514 (in list of species; ref. orig. descr.).—GRAY, Hand-List Birds, II, 1870, 273 (in list of species; references; range).

Eupsychortyx leucopogon GOULD, Mon. Odontophorinæ. 1850, text to pl. 13 ("San Carlos," in range; descr.; references).—GIEBEL, Thes. Orn., II, 1875, 142 (Gould's reference).—OGILVIE-GRANT, Cat. Birds Brit. Mus., XXII, 1893, 408, part, (Veragua; crit.).—OGILVIE-GRANT, Hand-Book Game-Birds, II, 1897, 130, part (syn.; descr.; range).—SHARPE, Hand-List Birds, I, 1899, 45, part (Panama, in range).—DUBOIS, Syn. Avium, II, 1902, 819 (references; range).—SALVIN and GODMAN, Biol. Centr.-Am., Aves, III, 1903, 295, part (Calobre and "San Carlos," Panama; descr. male; references).—BRABOURNE and CHUBB, Birds S. Am., I, 1912, 13, part (ref. orig. descr.; range).

Eupsychortyx leucotis (not *Ortyx leucotis* Gould) SALVIN, Ibis, 1876, 379 (Calobre [?], Veragua; crit.).

Description.—Adult male: forehead, crest, auriculars, and anterior half of throat and malar region soiled white; broad superciliary stripe, beginning above the eye, antique brown, bordered above by a narrow and irregular line of black which reaches the hindneck; nape medially dull cinnamon buff, obscurely mottled with dusky; sides of the neck marked with black and white, the feathers being white, with triangular black terminal spots, these spots tending to form a collar on the hindneck; upper parts sepia brown, tinged with russet anteriorly, vermiculated with black and irregularly mottled with black and argus brown centers to the feathers; scapulars, tertials, and wing-coverts with some white spots and irregular white edgings; upper tail-coverts and tail hair brown, finely mottled with soiled white, the markings tending to irregular bars; wings hair brown, the secondaries obscurely mottled externally with dull buffy; under wing-coverts hair brown, tipped with soiled white; posterior half of throat and malar region antique brown or chestnut, succeeded by a partly concealed collar of white spots; breast and sides hazel, everywhere marked with rounded twin terminal spots of white and subterminal bars of black, these spots becoming larger on the flanks, where they run several to each feather; chest and upper abdomen ochraceous buff medially, barred irregularly with black, each feather of these parts being barred with black and white and broadly tipped with ochraceous buff; lower abdomen plain buffy; under tail-coverts black, with white spots on each web.

Female similar to the male above, but the dark markings in general coarser; forehead and crest deep brown; superciliaries indistinct, ochraceous buff streaked with black; throat and malar region ochraceous or buffy, streaked with black; under surface from the throat down spotted with white and barred with black as in the male, but with very little rufescent color in evidence; chest and abdomen strongly tinged with buffy medially; dark markings of the under parts all coarser posteriorly and laterally.

Measurements.—Adult male (two specimens): wing, 95–101; tail, 55–57; bill, 13; tarsus, 28.5–30. Female (two specimens): wing, 97–102 tail, 50–58; bill, 12.5–13; tarsus, 28–31.

Range.—Western Panama.

Remarks.—Little appears to be known of this form, which is moreover involved in serious complications. It was described in 1842 by Lesson from "San Carlos, Americæ centralis Oceani Pacifici." In the same paper he describes two other species, *Crypticus apiaster* and *Pitylus lazulus*, from the same place, as well as several additional new forms from Realejo, Nicaragua, and Acapulco, Mexico, all collected by his brother, Adolphe Lesson. Now, the type-locality of *Pitylus lazulus* stands in the American Ornithologists' Union "Check-List of North American Birds," ed. 3, 1910, 285, as San Carlos, Salvador, while in the case of *Crypticus apiaster* Mr. Ridgway (Bulletin U. S. National Museum, No. 50, VI, 1914, 481, note) reaches provisionally the same conclusion. It follows, therefore, either that Lesson's type did not actually come from San Carlos, or that this particular form ranges much farther north than has heretofore been supposed, overlapping the range of "*Eupsychortyx*" *leylandi.* Judging by analogy, the latter supposition seems most unlikely. Lesson's description, brief as it is, seems perfectly applicable to the bird from Panama which we have described above, since he expressly says "fronte gulaque albidis, * * * collari antici, rufo." Turning now to Des Murs' work for further light on the matter, we find a discrepancy between the two descriptions, all the more remarkable because Des Murs states that "our figure is taken from an individual sent by the Honorable M. Lesson to the Museum of Natural History of Paris, in the galleries of which it figures today" (translation). Here the bird is figured and described as having the forehead and the throat white, but no mention is made of any rufous collar on the lower throat. On the other hand, "a white eyebrow starts from the outer angle of the eye, separated from the white of the throat by the brownish red which colors the cheeks" (translation). This part of the description is of course entirely inapplicable to our bird, but on referring to Gould we find that he too figures a precisely similar specimen. So conspicuous is this discrepancy that Mr. Ogilvie-

Grant is led to remark that "the striking differences shown in Gould's plate are probable improvements on nature, and the chestnut band which commences behind the eye and crosses the ear-coverts in his figure no doubt really represents the superciliary stripe." He remarks also: "I have not the slightest doubt that the bird from 'San Carlos in Central America' which formed the type of Lesson's *O. leucopogon* was merely a rather white-throated example of this species." Gould says: "I am indebted to the Baron de la Fresnaye for the use of the specimen from which the above characters are taken; it is the only one that has come under my notice." Now, there is a specimen in the Lafresnaye Collection (No. 7265), at present deposited in the Museum of Comparative Zoology at Cambridge, Massachusetts, which is an exact counterpart of Gould's plate, and is almost certainly the original from which it was drawn. It is certainly a very peculiar bird, with its pure white throat, white front and superciliaries, and dull brownish red postocular stripe. The breast is much duller (snuff brown) than in the Panama specimens, and the white spots are fewer. The crest is darker (mummy brown), and the nape rusty rather than buffy, but otherwise the upper parts are the same.

Whether this white-throated bird represents a color-phase of *E. leucopogon*, comparable to those of *E. sonnini*, or is a distinct species with a definite range, I am not prepared to say, preferring to await the receipt of further specimens and the re-examination of Lesson's type. Meanwhile I accept the name *leucopogon* for the bird from western Panama on the basis of the original description, waiving for the time being the question of the type-locality. The two males examined differ from the other forms of this group in having the throat distinctly and rather abruptly bicolor, the upper half white, the lower half antique brown; the forehead, crest, malar, and loral regions are also white. The upper parts are dark as compared with the allied races; this is not only because of the darker color of the ground-color itself, but also because of the prevalence of dark markings. Females, too, are very dark above, and heavily marked below.

Arcé secured at least three specimens of this form in Veragua, presumably from the vicinity of Calobre. The Agua Dulce

examples listed herewith are from the von Berlepsch collection; they are labeled as having been taken by R. Herrera in December, 1877. Nothing whatever is on record concerning its habits.

Specimens examined.—Panama: Agua Dulce, 3; unspecified, 1. Unspecified, 1. Total, 5.

Eupsychortyx leucopogon leucotis (Gould).

Plate V, figure 5.

Ortyx leucotis GOULD, Proc. Zool. Soc. London, 1843, 133 ("Bogotá," Colombia; orig. descr.; type in coll. Brit. Mus. [?]).—GRAY, Gen. Birds, III, 1846, 514 (in list of species; ref. orig. descr.).—GRAY, List Spec. Birds Brit. Mus., V, 1867, 77 ("Bogotá," Colombia; references).—GRAY, Hand-List Birds, II, 1870, 273 (ref. descr.; range).

Eupsychortyx leucotis GOULD, Mon. Odontophorinæ, 1850, pl. 10 and text (descr.; crit.).—SCLATER, Proc. Zool. Soc. London, 1855, 163 ("Bogotá," Colombia).—SCLATER and SALVIN, Nom. Avium Neotrop., 1873, 138, (in list of species; range).—GIEBEL, Thes. Orn., II, 1875, 142 (Gould's reference).—SCLATER and SALVIN, Proc. Zool. Soc. London, 1879, 544 (Medellin, Antioquia, Colombia; descr. eggs).—ROBINSON, A Flying Trip to the Tropics, 1895, 101, 153, part, pl. (Guaduas and Honda, Colombia; habits).

Eupsichortyx leucotis BONAPARTE, Compt. Rend., XLII, 1856, 883 (in list of species).

Eupsychortyx leucopogon (not *Ortyx leucopogon* Lesson) OGILVIE-GRANT, Cat. Birds Brit. Mus., XXII, 1893, 408, part ("Bogotá" and Medellin, Colombia; syn.; descr.; crit.).—SHARPE, Hand-List Birds, I, 1899, 45, part (Colombia, in range).—OATES, Cat. Birds' Eggs Brit. Mus., I, 1901, 66 (Medellin, Colombia; descr. eggs).—SALVIN and GODMAN, Biol. Centr.-Am., Aves, III, 1903, 295, part (Antioquia, Colombia; descr. female; references).—BRABOURNE and CHUBB, Birds S. Am., I, 1912, 13, part (range).

Colinus cristatus leucotis CHAPMAN, Bull. Am. Mus. Nat. Hist., XXXVI, 1917, 199 (Colombian localities [Caldas, Cali, La Sierra, El Eden, Chicoral, Honda, Purificacion, Fusugasuga, Anolaima, El Carmen, El Alto de la Paz]; range).

Subspecific characters.—Similar to *Eupsychortyx leucopogon leucopogon*, but upper parts paler, more grayish vinaceous, less brownish; white area of head in male restricted to chin, lores, and sub-loral region; breast more thickly spotted with white, and ground color paler, more russet; female with the throat, superciliaries, etc., not so heavily streaked, and the under surface in general whiter, the dark markings more restricted.

Measurements.—Male (twelve specimens): wing, 94–104 (average, 99); tail, 56–67 (60); bill, 11–13.5 (12.6); tarsus, 24–31 (28). Female (ten specimens): wing, 93–107 (99); tail, 57–65 (61); bill, 12–13 (12.7); tarsus, 24–30 (27.5).

Range.—Andean region of Colombia, from Antioquia and Santander south at least to the headwaters of the Rio Patio.

Remarks.—This form was described by Gould in 1843 as a distinct species, and figured a few years later. Naturally he considered it very distinct from *E. leucopogon* as he understood that species, and compared it only with *E. cristatus*. There can be no question, however, that *leucopogon* (as described in the present paper) and *leucotis* are conspecific, the differences between them being only of racial value. Indeed, specimens from western Colombia (Caldas and El Eden) in their paler throats, with the white of the chin more extended, whiter crests, and browner upper parts suggest an approach to *leucopogon*, and further material from this region would be most desirable. Although Salvin, misled by Gould's plate of *E. leucopogon*, referred his Veraguan specimens to *E. leucotis*, and Mr. Ogilvie-Grant, while remarking the difference between these and specimens from Antioquia, nevertheless lists both series under the earlier name, the two are sufficiently distinct from the standpoint of a trinomialist. The Colombian bird agrees with *leucopogon* in the color of the superciliary and malar stripes, which are amber brown, with practically no black in the former and very little in the latter, but the general coloration is paler, and the white of the head is more restricted. The flank-streaks in *leucotis* are apt to be black, with more or less russet centers, instead of rich hazel, with black mottling. Individual variation is considerable, however, affecting the color of the forehead and chin (which in some specimens is decidedly grayish) and the spotting of the under parts. I have examined at least two males (Nos. 112,275, Collection American Museum of Natural History, Chicoral, Colombia, and 59,602, Collection Carnegie Museum, Pena Blanca, Colombia) in which the breast has little or no russet color; being merely spotted black and white. The Peña Blanca bird has also a very pale throat, more like that of *littoralis*, and may indicate intergradation in the direction of *cristatus*, but as it is in the moult, and may be a young bird, I

cannot be sure. A female from this same locality has a pure white throat (except for a few irregularly scattered black feathers), and agrees with two females in the Lafresnaye Collection in this respect.

Gould's type of *leucotis* was a "Bogotá" skin, numerous examples of which he says came under his notice from time to time. Dr. Chapman has recently suggested Honda, on the Magdalena River northwest of Bogotá, as a more precise type-locality. He goes on to say: "This is a species of the Tropical Zone which in open country ranges upward into the Subtropical and even to the lower border of the Temperate Zone. It occurs on the western slope of the Western Andes in the arid Caldas Basin, is not uncommon in the Cauca Valley and is found as far south as La Sierra south of Popayan, this marking the southern known limits of the genus. In the upper Magdalena Valley it is abundant. To the west it reaches up the Central Andes to at least 8300 feet, and to the east we have specimens from the Eastern Andes almost up to the border of the Bogotá Savanna. Quail are said to occur in the Savanna but we have not succeeded in securing specimens and cannot say whether the Savanna quail is *leucotis* or *parvicristatus* or an intergrade between the two."

Mr. Carriker sent in a small series of this form from Aguachica, on the Magdalena River, and from El Tambor and Peña Blanca in Santander, while Lieutenant Robinson met with it at Guaduas and Honda, but secured only two specimens. "We found it impossible to flush them a second time; and it so happened that whenever we got shots, our guns were loaded with dust-shot, so we failed to stop the birds." (It may be remarked in passing that the plate in Lieutenant Robinson's book is a very poor representation, being much too red.) Salmon secured eggs at Medellin, in Antioquia; they are described as creamy buff, marked with pale rufous freckles and blotches.

Specimens examined.—Colombia: Guaduas, 2; Aguachica, 7; El Tambor, 2; Peña Blanca, 6; Caldas, 2; Yumbo, 2; Cali, 1; Chicoral, 4; El Eden, 1; Anolaima, 1; Fusugasuga, 1; Honda, 9; Mariquita, 2; El Alto de la Paz, 5; Purificacion, 1; "Bogotá," 4; "Colombian Andes," 1; "New Granada," 1. Unspecified, 2. Total, 54.

Eupsychortyx leucopogon decoratus Todd.

Plate V, figure 6.

Eupsychortyx parvicristatus (not *Ortyx parvicristatus* Gould) HEINE and REICHENOW, Nom. Mus. Heineani Orn., 1887, 294, part (Barranquilla, Colombia).

Eupsychortyx leucotis (not *Ortyx leucotis* Gould) ROBINSON, A Flying Trip to the Tropics, 1895, 153, part (Barranquilla, Colombia).

Eupsychortyx decoratus TODD, Proc. Biol. Soc. Washington, XXX, 1917, 6 (Calamar, Colombia; orig. descr.; type in coll. Carnegie Mus.).

Colinus cristatus decoratus CHAPMAN, Bull. Am. Mus. Nat. Hist., XXXVI, 1917, 198 (Calamar and Turbaco, Colombia; crit.).

Subspecific characters.—Similar to *Eupsychortyx leucopogon leucotis*, but more richly and deeply colored throughout, the male with the throat rich chestnut, the breast almost or quite concolor, and the white spots smaller; sides and flanks very heavily marked with chestnut; superciliary and malar stripes much varied with black. Female more heavily marked below, the throat more decidedly tinged with buffy ochraceous, and more heavily streaked with black.

Measurements.—Male (seven specimens): wing, 99–105 (average, 103); tail, 60–69 (66); bill, 12.5–13 (13); tarsus, 29–31 (30). Female (five specimens): wing, 101–106 (102); tail, 60–63 (61); bill, 12–13 (12.7); tarsus, 28–29 (28.5).

Range.—Lower Magdalena Valley, Colombia, and westward along the coast at least to the Sinu River.

Remarks.—A small series of quail collected by Mr. Carriker at Calamar, on the lower Magdalena River, and Punto Zapote, in the delta of the Sinu River, were at first referred to *leucotis*, until comparison with specimens from the interior of Colombia showed that they did not belong to that form. So strongly marked did their characters appear by comparison, and such was the uncertainty in the writer's mind as to the inter-relations of this group, that he preferred to treat the new form provisionally as a full species. It is certainly a strongly marked subspecies, differing from *leucotis* in its much richer coloration throughout, and from *leucopogon* by its rather paler, more rufescent, less brownish upper parts, decidedly darker breast, and in particular by the restriction of the white area on the head, in which latter respect it resembles *leucotis*. Unlike either of these forms, however, it has the superciliaries conspicuously streaked with black, and

considerable black on the malar region also. Its relationships to *littoralis* will be discussed under the head of that form.

Females of this form resemble those of *leucopogon* very closely, having prominently marked under parts and heavily streaked throats; the upper parts, however, are not so decidedly brownish or so much mottled, especially anteriorly. Three young birds from Calamar (January 2 and 22) are like the adult female, but the spotting below is less distinct, and the flanks are marked with broad shaft-streaks of black centered with sayal brown; the crown and crest are brown like the rest of the upper parts.

Since this form has been described several other specimens have turned up in the collections of various institutions, all of which are duly listed herewith. As said by Dr. Chapman, it is evidently restricted to the Caribbean Fauna, and is doubtless strictly littoral in its distribution. Considerably to my surprise I find that a specimen from Fundacion, on the southern confines of the Santa Marta region, belongs here rather than to *littoralis*, but otherwise all the specimens with authentic data come from the region of the lower Magdalena and Sinu Rivers. There are a pair of birds, perfectly typical of this form, in the collection of the Museum of Comparative Zoology which are said to have come from the line of the Panama Railway, but the assigned locality is almost certainly a mistake. Indeed, the Biological Survey party failed to secure a single specimen of *Eupsychortyx* in their exhaustive work in this region, and the chances are that if any form of the group occurs it would be *leucopogon*.

Specimens examined.—Colombia: Fundacion, 1; Calamar, 8; Turbaco, 1; Savanilla, 1; Punto Zapote, 1; unspecified, 3. "Line of Panama Railway" (?), 2. "Orinoco" (?), 1. Total, 18.

Eupsychortyx leucopogon littoralis Todd.

Plate V, figure 7.

Eupsychortyx leucopogon (not *Ortyx leucopogon* Lesson) ALLEN, Bull. Am. Mus. Nat. Hist., XIII, 1900, 127 (Bonda, Colombia).

Eupsychortyx cristatus littoralis TODD, Proc. Biol. Soc. Washington, XXX, 1917, 6 (Mamatoco, Colombia; orig. descr.; type in coll. Carnegie Mus.).

Colinus cristatus littoralis CHAPMAN, Bull. Am. Mus. Nat. Hist., XXXVI, 1917, 198, in text (Bonda, Colombia; crit.).

Subspecific characters.—Similar in general to *Eupsychortyx leucopogon decoratus*, but the male paler throughout, the throat buffy, more or less deeply shaded with ochraceous tawny or amber brown, but not distinctly bicolor; the breast also decidedly paler, more russet; female also slightly paler, and not so heavily marked below, the throat nearly or quite immaculate.

Measurements.—Adult male (eight specimens): wing, 100–106 (average, 103); tail, 57–63 (60); bill, 11.5–13 (12.5); tarsus, 27–32 (29). Female (eight specimens): wing, 97–105 (101); tail, 55–65 (61); bill, 12–13 (12.5); tarsus, 27–30 (29).

Range.—Lower Tropical Zone of the Santa Marta region of Colombia.

Remarks.—Santa Marta specimens received from Mr. Herbert H. Smith were referred by Dr. Allen to *E. leucopogon* without comment, but, as we now know, the "*leucopogon*" of the "British Museum Catalogue" is composite, comprising two recognizably distinct races, *leucopogon* and *leucotis*, to neither of which the Santa Marta specimens can properly be referred. From the former they differ in much paler coloration throughout, the upper parts being washed with vinaceous anteriorly and with grayish and buffy posteriorly, the scapulars and tertials conspicuously margined with white or buffy and spotted and blotched irregularly, together with the lower back, with black and brown. In *leucopogon* the general tone of the upper parts is much deeper, so that the black and brown markings are not in such evident contrast; the white edgings are also far less conspicuous. The superciliaries are streaked with black in the present form, instead of being pure antique brown, as in both *leucopogon* and *leucotis*, and the throat is shaded with the same color, most heavily posteriorly, the color gradually fading out in front, while in *leucopogon* the transition is more abrupt. Compared further with *leucotis*, males have the breast more richly colored, the buffy patch on the chest and abdomen is deeper, antique brown in fact, and the under parts in general are more buffy. Females, like males, are not nearly so dark as females of *leucopogon;* they are more buffy below than the same sex of *leucotis*, as well as paler above.

With the series before me I have no difficulty whatever in separating *littoralis* from *decoratus* by its uniformly paler, duller

coloration in both sexes. There is, however, an unusual amount of individual variation in the present form, some specimens approaching *decoratus*, while others, with their pale throats and under parts and more heavily black-streaked superciliaries, verge more toward *cristatus*. So far as the evidence afforded by the examination and comparison of specimens goes, therefore, we would be justified in concluding that *littoralis* is not a subspecies or geographical race in the same sense as *decoratus*, for example, but rather stands for a set of individuals showing the respective characters of both *decoratus* and *cristatus*, combined in varying degree. In short, *littoralis* bears all the earmarks of being an intergrade between these two forms, occurring in the region where their respective ranges might naturally be supposed to meet and overlap. At Fundacion, south of Santa Marta, we find nearly typical *decoratus*, while at Rio Hacha, at the western edge of the Goajira Peninsula, we get a bird which is clearly *cristatus*, although slightly tending towards the other. It so happens, however, that west of Rio Hacha the heavy forest of the Tropical Zone comes right down to the coast, constituting a barrier to the spread of either form which may be quite as effective as the high mountain mass of the Sierra Nevada de Santa Marta itself. Indeed, it is far more likely that actual intermingling of the two forms, if it occurs at all, would be found in the low, more open country to the southward of the Sierra Nevada, which is presumably better adapted to the needs of such a bird as this. Unfortunately no evidence bearing on this point is yet available; it is clear, however, that if *cristatus* is a derivative of the *leucopogon* group, or *vice versa*, one or the other must have originally passed through this narrow gap to occupy its present range, assuming, of course, that topographical and other conditions were the same as at present.

But even if intergradation between *cristatus* and the *leucopogon* group could be fully proven it would not therefore necessarily follow (in the opinion of the writer) that the two should be regarded as conspecific. Each has characters not possessed by the other, to belittle which by degrading the forms in question to subspecific rank would seem to be highly inadvisable. Subspecies are of course "representative forms," but "representative forms"

are not necessarily subspecies, as some ornithologists of note would have us believe. It has long been the opinion of the writer that the mere fact (known or assumed) of the intergradation of two given forms should not of itself militate against their being considered distinct specifically, provided that the degree and character of the differences between them are such as to otherwise justify such standing. All the circumstances bearing on each individual case must be taken into consideration in attempting to reach a decision, and to be blindly governed by a single criterion is inevitably to go astray. The recent paper by Dr. Jonathan Dwight on the genus *Junco* (cf. *Bulletin American Museum of Natural History*, XXXVIII, pp. 269–309), considered as a protest against the current practice of reducing all intergrading forms to subspecific rank, is interesting and suggestive.

It remains to add that the present form was provisionally described as a subspecies of *E. cristatus*, being compared with mainland specimens of that form, which were incorrectly assumed to represent *horvathi*.

Specimens examined.—Colombia: Bonda, 4; Cacagualito, 1; Mamatoco, 9; Gaira, 2; Santa Marta, 2. Total, 18.

Eupsychortyx cristatus cristatus (Linnæus).

Plate V, figure 8.

"Caille Hupée du Mexique" BRISSON, Orn., I, 1760, 260, pl. 25, fig. 2, excl. syn. ("Guiana and Mexico"; descr.).—D'AUBENTON, Pl. Enlum., 1770–86, No. 126.

Tetrao cristatus LINNÆUS, Syst. Nat., ed. 12, I, 1766, 277, excl. syn. part (*ex* Brisson; diag.).—GMELIN, Syst. Nat., II, ii, 1788, 765, excl. syn. part (diag.; references).

"Crested Quail" LATHAM, Gen. Syn. Birds, II, ii, 1783, 784, excl. syn. part ("Guiana and Mexico"; descr.).—LATHAM, Gen. Hist. Birds, VIII, 1823, 329, excl. syn. part (descr.; references).

Perdix cristata LATHAM, Index Orn., II, 1790, 652, excl. syn. part (diag.; range; references).—TEMMINCK, Hist. Nat. et Gén. Pigeons et Gallinaces, III, 1815, 446 (descr.; habits), 736, excl. syn. part (diag.; references).—VIEILLOT, Nouv. Dict. d'Hist. Nat., XXV, 1817, 247 (descr.; habits).—KUHL, Buffoni et Daubentoni figurarum avium Coloratarum Nomina Systematica, 1820, 3 (D'Aubenton's plate).—LESSON, Traité d'Orn., 1831, 508 (in list of species; range).

Coturnix cristata BONNATERRE, Tabl. Enc. et Meth., I, 1791, 222, pl. 96, fig. 4 (descr.; range; references).

Ortyx temminkii STEPHENS, in Shaw's Gen. Zool., XI, 1819, 381 ("Mexico"; descr.; references).

Ortyx neoxenus VIGORS, Proc. Com. Sci. and Cor. Zool. Soc. London, I, 1830, 3 (orig. descr.; no locality specified).—(?) AUDUBON, Syn. Birds N. Am., 1839, 200 ("California" [error]; descr.; references).—BOLLE, Journ. f. Orn., IV, 1856, 167 ("Trinidad" [error]).

Ortyx cristata LESSON, Ill. Zool., I, 1831, text to pl. 52 ("Mexico"; diag.).—JARDINE and SELBY, Ill. Orn., 1828, I, text to pl. 38 (diag.; range; references).

Ortyx cristatus GRAY, List Spec. Birds Brit. Mus., III, 1844, 44 ("S. Am."; references).—GRAY, Gen. Birds, III, 1846, 514 (in list of species; references).—GRAY, List Spec. Birds Brit. Mus., V, 1867, 76 ("South America"; references).—VON PELZELN, Ibis, 1873, 36 (Latham's reference).

(?)*Perdix neoxenus* AUDUBON, Birds Am., IV, 1838, pl. 423.—AUDUBON, Orn. Biog., V, 1849, 228 ("Northwest coast of America" [error]; descr.).

Eupsychortyx cristatus GOULD, Mon. Odontophorinæ, 1850, pl. 9 and text, excl. syn. part (descr.; syn.; crit.).—GARROD, Proc. Zool. Soc. London, 1873, 468 (carotid artery); 1873, 640 (muscles).—GIEBEL, Thes. Orn., II, 1875, 142 (Gould's reference).—COOPER, Bull. Nuttall Orn. Club, II, 1877, 95 (syn.).—VON BERLEPSCH, Journ. f. Orn., XL, 1892, 68 et seq., 98–100, 102 (Savonet, Curaçao; crit.).—OGILVIE-GRANT, Cat. Birds Brit. Mus., XXII, 1893, 407 (syn.; descr.; range).—HARTERT, Ibis, 1893, 305 (Aruba; crit.), 325 (Curaçao), 338 (range).—ROBINSON, A Flying Trip to the Tropics, 1895, 164 (Curaçao).—OGILVIE-GRANT, Hand-Book Game-Birds, II, 1897, 128 (syn.; descr.; range; habits).—SHARPE, Hand-List Birds, I, 1899, 45 (Curaçao and Aruba, in range).—DUBOIS, Syn. Avium, II, 1902, 819 (references; range).—HARTERT, Nov. Zool., IX, 1902, 306 (Aruba and Curaçao).—FAXON, Auk, XX, 1903, 239 (syn.).—CORY, Field Mus. Orn. Series, I, 1909, 198 (Aruba), 204 (Curaçao).

Eupsichortyx cristata BONAPARTE, Compt. Rend., XLII, 1856, 883 (in list of species).

Ortyx sp. PETERS, Journ. f. Orn., XL, 1892, 114 (Curaçao).

Eupsychortyx gouldi VON BERLEPSCH, Journ. f. Orn., XL, 1892, 100, in text (Curaçao; provisional new name).—HARTERT, Ibis, 1893, 305 (crit.).

Eupsychortyx cristatus continentis CORY, Field Mus. Orn. Series, I, 1913, 283 (El Panorama, Rio Aurare, Venezuela; orig. descr.; type in coll. Field Mus. Nat. Hist.).

Description.—Male: forehead, middle of crown, and crest buffy white, sometimes with a tinge of ochraceous; broad superciliaries, beginning above the eye, and malar stripe (sometimes obsolete) black, contrasting with the silky white auriculars, and terminating posteriorly in an area

of black and white spots on the side of the neck, each feather being white, tipped with a triangular spot of black; upper back russet, more or less shaded with gray and finely but indistinctly vermiculated with black; lower back similar but more grayish or buffy, with irregular black and ochraceous blotches on each feather, these blotches becoming streaks on the upper tail-coverts; tail indistinctly barred and finely but obscurely vermiculated with neutral gray (or dusky) and soiled white; primaries plain hair brown, their outer webs slightly paler; secondaries similar but with the outer webs finely mottled with cinnamon or dull buffy in increasing amount, the inner secondaries and scapulars colored like the lower back, and with their inner (and often outer) webs broadly edged with dull white, giving a prominently streaked appearance to these parts; wing-coverts like the back, with more or less submarginal black spotting and white edging; under wing-coverts hair brown, margined more or less broadly with white; throat plain warm buff or buffy white, abruptly contrasted with the breast, which is covered with rounded white spots, two to each feather, separated from each other by a shaft-streak of russet and preceded by a black spot or bar; these white spots grow larger on the sides and increase in number on the feathers, finally coalescing into notched streaks on the feathers of the flanks; under tail-coverts buffy, with black shaft-streaks; chest and upper abdomen with a large patch of antique brown, formed by the ends of the feathers, which are basally white, barred with black; lower abdomen buffy; "iris brown; bill black; feet pale bluish horn."

Female similar in general to the male (except for the markings of the head), but duller, the markings above coarser, the under surface paler, with more white and less brown, the chest area ochraceous buff; middle of crown (including crest) dull buffy or brown, with more or less black intermixed; broad superciliaries and throat ochraceous, with faint darker margins to the feathers; auriculars hair brown; otherwise about as in the male. (The female is not known to assume the full male plumage, as has been intimated by certain authors).

Young (juvenal dress) similar to the adult female, but duller, more brownish above, the markings coarser, the head-pattern merely indicated, and the throat dull buffy, clouded with dusky across the middle.

Measurements.—Male (thirteen specimens): wing, 97–109 (average, 101); tail, 56–69 (64); bill, 11.5–14 (13); tarsus, 27–30 (29). Female (eleven specimens): wing, 93–107 (101); tail, 58–70 (63); bill, 12–13 (12.5); tarsus, 26–30 (28).

Range.—Western Venezuela (States of Falcon and Lara) and outlying islands of Aruba and Curaçao, Dutch West Indies, west to the Goajira Peninsula, Colombia.

Remarks.—This species was the first of the group to receive a binomial name, having been designated *Tetrao cristatus* by

Linnæus in 1766. His name was based primarily upon Brisson's "Caille Hupée du Mexique," the description and plate of which are not quite clear, but apparently indicate the species under consideration rather than *E. sonnini.* Brisson, it is true, quotes "Guiana and Mexico" as the source of his specimens, which he says had been sent to the museum of the Abbé Aubry. He cites also several previous authors, including Barrere and Hernandez. We have already shown that the Barrere citation belongs to *E. sonnini,* while it is practically certain that the "Quauhtzonecolin" of the latter author refers to the bird now known as *Philortyx fasciatus,* as I am informed by Mr. E. W. Nelson. But, as suggested by Dr. Hartert, it is quite as likely that the Abbe Aubry's Museum had got its specimens from Curaçao as from Guiana, and in any case we are probably justified in accepting Brisson's description as the sole basis of Linnæus' name, leaving all earlier authors entirely out of consideration.

Great uncertainty seems to have prevailed for many years with regard to the true habitat of this species. Some authors gave it "Mexico," doubtless on the authority of Hernandez, who is wrongfully quoted by Brisson and others to this effect, while others more vaguely gave it as "South America." Even as late as 1850, when Gould brought out his great work on the Odontophorinæ, he was unable to assign any more definite locality than "Mexico," although it is evident that numerous specimens were then extant. Indeed, it was not until 1892 that von Berlepsch secured an authentic specimen from the island of Curaçao, in the Dutch West Indies. While clearly distinguishing his specimen from the Guiana form, he suggested that the *E. cristatus* of Linnæus (*ex* Brisson) was probably the same as the latter, and he therefore proposed for the Curaçao bird the provisional name of *Eupsychortyx gouldi.* But I agree with Dr. Hartert, who found the bird on Curaçao and Aruba in the summer of 1892, that Linnæus' name is better applied to the form under consideration. Aside from von Berlepsch's proposed name, the species had already received two other synonyms, *Ortyx temminkii,* proposed by Stephens in 1819, and *Ortyx neoxenus,* applied by Vigors in 1830 to living examples in the collection of the Zoological Society of London, and which (according to Gould) turned out to be female individuals of the

present form. It is doubtful, however, if the bird figured by Audubon from the "northwest coast of America" really belongs here,

Up to 1911 the typical form was not certainly known to occur on the adjoining mainland, although in the meantime Dr. von Madarasz had described a race from the Andes of Merida. In that year, however, a small series was received by both the Field and the Carnegie Museums from sundry localities in northwestern Venezuela. Mr. Cory presently described his series from the Rio Aurare (opposite Maracaibo) as a new subspecies, but I must confess that with his type series and other specimens before me I am unable to separate them satisfactorily from Curaçao birds, all the characters assigned proving too inconstant. In 1914 the receipt of specimens from Rio Hacha, Colombia, by the Carnegie Museum extended the range of the species to include the Goajira Peninsula. The Rio Hacha birds, however, show apparent signs of an influx of *leucopogon* blood. The males have rather more amber brown feathers in the superciliaries than is usual with *cristatus*, while the females have the buffy color of the under parts paler, and the markings of the throat tending to streaks rather than squamations.

In all probability the continental range of this form includes all the low region (Tropical Zone) in the vicinity of Maracaibo Lake and Gulf, in the pocket formed by the Andes of Venezuela and the Eastern Andes of Colombia. As already shown, it extends westward along the coast to approximate the range of *E. leucopogon*, and there is a possibility that it may also meet the range of *E. sonnini* to the eastward. Concerning its habits, as observed by him in the Dutch West Indies, Dr. Hartert writes as follows:

"This pretty bird is not rare in Aruba and Curaçao, but is not found everywhere. The natives call it 'Socklé,' a name derived from its note, which is uttered very frequently. It is much esteemed as food, and sometimes sold in the market alive.

"This bird is not easy to obtain in any great numbers without a dog, as it does not care to fly and is difficult to be seen in grassy places. It is not found on Bonaire."

Specimens examined.—Venezuela: Tocuyo, 5; Guarico, 1; Rio Aurare, 4. Colombia: Rio Hacha, 6. Dutch West Indies: Savonet, Curaçao, 6; Curaçao, 7. Total, 29.

Eupsychortyx cristatus horvathi von Madarasz.

Eupsychortyx horvathi VON MADARASZ, Ann. Mus. Hungarici, III, 1904, 116, pl. 12 (Pedregosa, Venezuela; orig. descr.; type in coll. Budapest Mus.).—BRABOURNE and CHUBB, Birds S. Am., I, 1912, 13 (ref. orig. descr.; range).

Subspecific characters.—Similar to *Eupsychortyx cristatus cristatus,* but back and wings with much less rufescent tinge, and shaft-stripes on sides and flanks darker and less uniform. Female differing conspicuously in having a streaked or spotted throat.

Measurements.—Male (one specimen): wing, 98; tail, 62; bill, 12; tarsus, 31. Female (two specimens): wing, 98–101; tail, 63–66; bill, 11–13; tarsus, 30–31.

Range.—Andes of Merida, Venezuela.

Remarks.—This form was described and figured by Dr. von Madarasz from two male examples forwarded to the Hungarian National Museum by the well-known collectors, S. Briceño Gabaldòn e hijos. It was said to differ in its thicker and larger bill, and also in having the forehead, crown, and throat pure white, without any tinge of fawn color, while the lower throat and the sides are more sharply outlined and brightly colored. It is true that in the single male before me the crest and throat are rather purer white than in typical *cristatus,* but I doubt if this distinction would hold in a series. The other characters assigned are certainly of no value, notwithstanding which the general coloration of the upper parts is decidedly more grayish, less rufescent, and the female is so different in the markings of the throat that there can be little question as to the propriety of recognizing the form as subspecifically distinct. It appears to be restricted to the Subtropical Zone of the Andes of Merida.

Specimens examined.—Venezuela: Valle (2000 m.), 1; Pedregosa (2000 m.), 1; Milla (1630 m.), 1. Total, 3.

Carnegie Museum, Pittsburgh, Pa.

EXPLANATION OF PLATE V.

Figure 1.—*Eupsychortyx sonnini sonnini*, normal phase. No. 46646, Collection Carnegie Museum, male, El Trompillo, Carabobo, Venezuela.

Figure 2.—*Eupsychortyx sonnini sonnini*, black-throated phase. No. 78389, Collection American Museum of Natural History, Maripa, Rio Caura, Venezuela.

Figure 3.—*Eupsychortyx sonnini mocquerysi*, white-throated phase. No. 39162, Field Museum of Natural History, Margarita Island, Venezuela.

Figure 4.—*Eupsychortyx leucopogon leucopogon*. No. 147784, Collection U. S. National Museum, Panama.

Figure 5.—*Eupsychortyx leucopogon leucotis*. No. 17535, Collection M. A. Carriker, Jr. (in Philadelphia Academy of Natural Sciences), Aguachica, Magdalena River, Colombia.

Figure 6.—*Eupsychortyx leucopogon decoratus*, type. No. 51975, Collection Carnegie Museum, Calamar, Bolivar, Colombia.

Figure 7.—*Eupsychortyx leucopogon littoralis*, type. No. 38151, Collection Carnegie Museum, Mamatoco, Colombia.

Figure 8.—*Eupsychortyx cristatus cristatus*. No. 44090, Collection Field Museum of Natural History, Rio Aurare, Venezuela.

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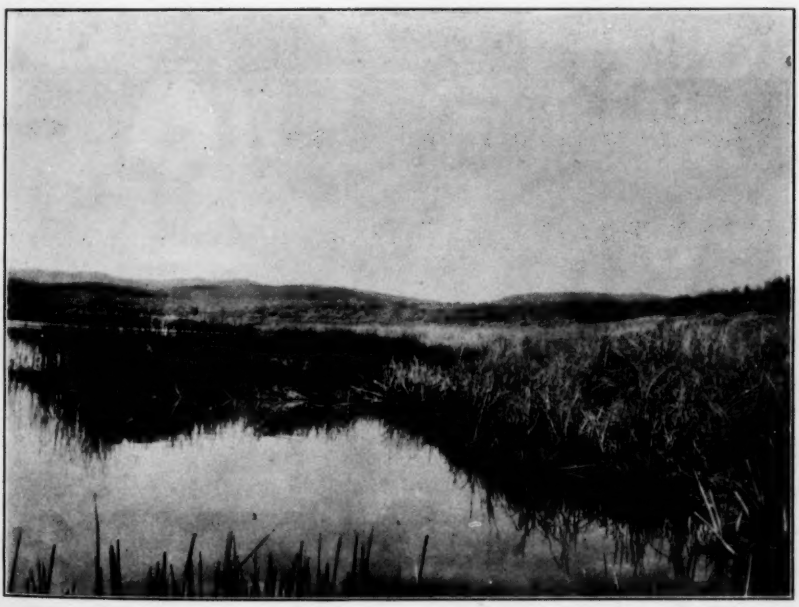


2

1. View in narrow southern portion of Lake Burford. Broad-leaved cottonwood (*Populus wislizeni*) at left.

2. Shore of Lake Burford south of Chama Rod and Gun Club Cabin showing fringing growth of tules and sage grown knolls.

OBSERVATIONS ON THE HABITS OF BIRDS AT LAKE BURFORD, NEW MEXICO.

BY ALEXANDER WETMORE.

Plates VII–IX

INTRODUCTION

Lake Burford, the largest natural body of water found in New Mexico, is situated in the Jicarilla (Apache) Indian Reservation in the northwestern part of the state. This lake for many years was known as Stinking Lake and is so shown on most maps, a name derived from the Spanish appellation, of "La Laguna Grande Hedionda" (so called from a spring of sulphur-tainted water near the western side). Recently the lake has been given much prominence as a possible breeding ground for water birds by various interested agencies and it was decided that it would be fitting to give it a more euphonious name. On May 3, 1918, therefore, by petition of the Southwestern Geographic Society and the New Mexico Game Protective association, it was rechristened Lake Burford, in honor of the late Miles W. Burford of Silver City, New Mexico, a gentleman who had been prominent as a pioneer in promoting the cause of game protection in the state.

The work on which the following notes are based was carried on in the interest of the Biological Survey, United States Department of Agriculture, and covered the period from May 23 to June 19, 1918. Through the kindness of Mr. H. L. Hall and Mr. C. McFadden of Chama, New Mexico, permission was received to occupy an adobe cabin at the lake, belonging to the Chama Rod and Gun Club, while Mr. P. G. Orell rendered aid in assembling needed camp equipment. I reached Chama on the afternoon of May 22, and left for Lake Burford at noon the following day after outfitting for a month's work in the field. Jimmy Barnett of Chama accompanied me as assistant in camp. The trip to the lake, made in a Ford auto truck, required four hours, a sufficient commentary on the state of the mountain roads, as the distance travelled was only about forty miles. Visits were made to a lumber camp at El Vado for mail and supplies on May 31 and June 12, and we returned to

Chama on June 19. Our stay at the lake extended over a period of four weeks.

PHYSICAL FEATURES

Lake Burford is located approximately at 7000 feet above sea level and lies in a trough or depression extending north and south near the summit of the Continental Divide. The lake covers an irregular basin surrounded by rolling knolls, that around most of the shore come down directly to the water. These are strewn with loose fragments of sandstone and overgrown with sage. In several places rocky promontories of yellowish white sandstone rise abruptly from the water's edge. Near these the lake bottom is hard and firm; elsewhere it is composed of soft black mud that is deep and treacherous. The shoreline in 1918 was between 15 and 17 miles in all, and the water surface extended over between 4 and 5 square miles. The northern end of the lake is broad and open, while the southern part is cut by projecting promontories into several small bays (Plate VII, fig 1). In the southern area are three small islands. The depth of the lake in the center varied from 6 to 9 feet. Lake Burford receives its water supply from snow water and rain, and to some extent from springs. In extremely high water it may overflow from a narrow east bay down a great cleft in the sandstone rock known as La Puerta Grande, that leads down toward the Chama (or Brazos) River, but within modern times the water content of the lake has not reached such a level. There is, however, an underground flow here that feeds two small lakes below the large one, and seepage continues on below these.

The waters of Lake Burford are distinctly alkaline, though the alkali is not concentrated, so that sheep, cattle and horses water here without trouble. Where low flats bordered the shore a thin alkaline scale or efflorescence formed on the surface of the mud, and isolated pools in such areas were found to be strongly saline. There was a decided difference in appearance in the water of the northern and southern parts of the lake. That in the broad, open northern portion was gray, murky and opaque, so that objects four inches below the surface were barely visible. The water in the southern end was clearer and contained less sediment, so that bottom might be seen at a depth of three feet. This difference

may be due in part to the presence of springs in the southern end (though none were located) and in part to the fact that the wind sweeps strongly across the open north end, so that the waves usually run high every afternoon and evening, a condition that would tend to keep the water roily.

The spring of 1918, had been very dry and the fall of snow during the previous winter below normal, so that at the time of my work the lake level was two and one half to three feet below that of last year. The water area varies greatly as the seasons change from year to year, and I was told that in the past ten years the water once had been down between 4 and 5 feet below its present level. During the spring months there is said to be a running stream in a small draw that reaches the lake on the northeastern side near the cabin (Plate VIII, fig. 2), but in 1918 this was dry. In some places Mexican sheep herders secured water for drinking from seep holes dug a few feet from the lake shore, but this was found to be too strong to be good, and for our use we carried water from some slightly alkaline pools located below a grove of large cottonwoods in the draw mentioned above. Later this seepage water became too bad, and further search revealed a small spring of good water four hundred yards above the cottonwoods.

The two small lakes formed by seepage from Lake Burford were about a mile and a half below the main lake. The first of these had an area of about 40 acres and was grown with *Scirpus occidentalis*. The second, known to the Mexicans as La Laguna de la Puerta, or La Laguna Thompson (named for Mr. Thompson of Chama, who formerly lived nearby), was a third of a mile long and an eighth of a mile broad. There was also a small lake 500 yards long by 100 yards broad situated northeast of the cabin, cut off by low knolls from Lake Burford, that was known as Hayden's or Clear Lake. Water birds of several species flew back and forth to these smaller lakes regularly.

It was said that Lake Burford was usually frozen over by the first of December, though ice formed along the shores earlier, and that the water was open again by the first of March. It was difficult, however, in the short time spent at Chama, to secure accurate information on this point as the lake has been remote from travelled paths and few have come here save in summer and fall. With-

in a short period Largo and Tapacitos Canyons to the west have been colonized and many more white people have come into this area. El Vado is the present railroad point from which these settlers receive supplies, and as the road to El Vado passes the lake, the region is becoming more frequented.

Conditions at the lake are such that spring is late and it was curious that when I arrived the season was farther advanced on the high pine covered slopes than lower down along the shore. From May 24 to June 5 the average morning temperature at 6:00 A. M. was about 40° F., while on May 26 and 27 ice was found in the rushes bordering the beaches. After June 5th it became warmer. Heavy winds from the west prevailed during May, but moderated later. At the time of my arrival black willows were beginning to bloom in protected places, and in a few spots along the lake shore small broad-leaved and narrow-leaved cottonwoods were in bud. Gray willows did not blossom until June 17th. By June 6th vegetation showed slight increase as growth, retarded by the cold nights, was slow. The breeding season for marsh birds (save the passerines) did not begin until about May 25 and was not at its height until June 10, while Eared Grebes had just begun their nest-building on June 18.

The work at Lake Burford was undertaken primarily to ascertain what species of water birds bred there and in approximately what numbers these occurred. Comparatively little collecting was done, as it was desired to disturb the birds as little as possible, but long hours each day were spent in observation, aided where necessary by the use of 8-power binoculars. The natural conditions at the lake were such as to render observation of the avian inhabitants a comparatively simple matter. A stand of dead tules remaining from last year bordered much of the shoreline, and the broken clumps of these rushes were just high enough to form a natural blind wherever I cared to sit down and watch. When observation at long distance was necessary other cover was available in the sagebrush on the knolls above. Most of the birds that occurred here were very tame and it was the ordinary thing to have them carry on the business of every day life, with no sign of fear or uneasiness, within 30 to 100 feet of me as I lay concealed in the rushes.

GENERAL CONDITIONS

The water of Lake Burford, while not bad, was at the same time distinctly alkaline as has been previously stated, so that the aquatic and semiaquatic vegetation was limited to those forms of plant life characterized by a marked tolerance for alkali. The round-stemmed bulrush or tule (*Scirpus occidentalis*) was the most prominent of these. Considerable areas along the south, west and north shores were entirely bare and open but elsewhere this plant formed a growth in the water, extending from the shoreline out for a distance of from one to fifty feet. In general it grew as a fringing band from six to ten feet broad (Plate VII, fig. 2). The dead stems of this tule formed dense masses, matted firmly by the winter's snow and ice, to be penetrated and traversed only with much trouble, a safe cover for many nests as the ducks were able to creep in underneath the interlaced stems and here conceal their eggs. On May 24 the new growth was just starting and much of it had been frost-bitten so that the tips showed as brown dead spikes. Two weeks later the new growth was extensive and formed an efficient cover (Plate VIII, fig, 1). New clumps were appearing in shallow open water also where all last year's growth had been destroyed by ice so that by the first of July the area covered by this plant must have been extensive.

Bayonet grass or three-square (*Scirpus paludosus*) was common and salt grass (*Distichlis spicata*) was abundant in suitable places along the shore where it grew with foxtail (*Hordeum jubatum*). Sage brush (*Artemisia tridentata*) covered all of the knolls and rolling slopes, in most places coming down to the beach. A linear leaved pondweed (*Potamogeton pectinatus*) was the most abundant of the truly aquatic plants and with it, clogging and enveloping its leaves, were great masses of a green alga. On May 23, when work was begun at the lake, the pondweed was appearing as scattered filaments on the floors of sheltered bays. As the water became warmer this growth increased and by June 18, it had begun to appear in large areas at the surface. By July 1, it must have covered practically the entire lake. Ditch-grass (*Ruppia occidentalis*) was found in the Laguna de la Puerta and a muskgrass (*Chara* sp.) was common in the spring holes from which we

secured drinking water. The cat-tail (*Typha latifolia*) was fairly common. A black and a gray willow grew at intervals along the lake shore, and both narrow-leaved and broad-leaved cottonwoods (*Populus angustifolia* and *P. wislizeni*) were found in small numbers (Plate IX, fig. 1). At a few points wild currant (*Ribes inebrians* and *R. aureum*), choke cherry (*Padus melanocarpa*) and service-berry (*Amelanchier*) were abundant in the hills and came down above the shore of the lake on protected north slopes. The yellow pine (*Pinus brachyptera*) grew in open forests over the higher hills (Plate IX, fig. 2) interspersed with pinyons and cedars which came down over the lower slopes. Douglas fir was found in some of the gulches and there were many groves of a small oak in valleys in the hills.

There were no fish of any species in the lake. The axolotl (*Ambystoma*) was abundant and was the source of food of mergansers and herons. The Mexican name of this curious creature was in common use, but was usually corrupted by Americans to "water loty." These creatures were observed lying on aquatic growth a foot or so beneath the surface, basking in the sun's rays, and at my approach turned with a quick wriggle and disappeared in the murky water below. In feeding on Chironomids resting on the surface film, these water dogs broke at the surface as fish might, and at such times seemed surprisingly active for creatures ordinarily considered so sluggish. During June they began to die in considerable numbers for no apparent reason (save perhaps that they had lived their allotted span of life) and were found floating on the surface or washed up along the shore. For a period the Night-Herons, acting as scavengers, disposed of them as they appeared, but later so many of the bodies were present that an effluvium arose from them in early morning, after the air had lain quiet over the surface of the lake during the night.

Along low marshy shores frogs (*Rana pipiens*) were fairly common while in spring holes back of the lake these were abundant.

Among mammals coyotes were fairly common, signs of an occasional badger, wild cat or skunk were found, porcupines were seen in the hills and deer were fairly commom. The track of a wolf was observed on one occasion.

General Discussion

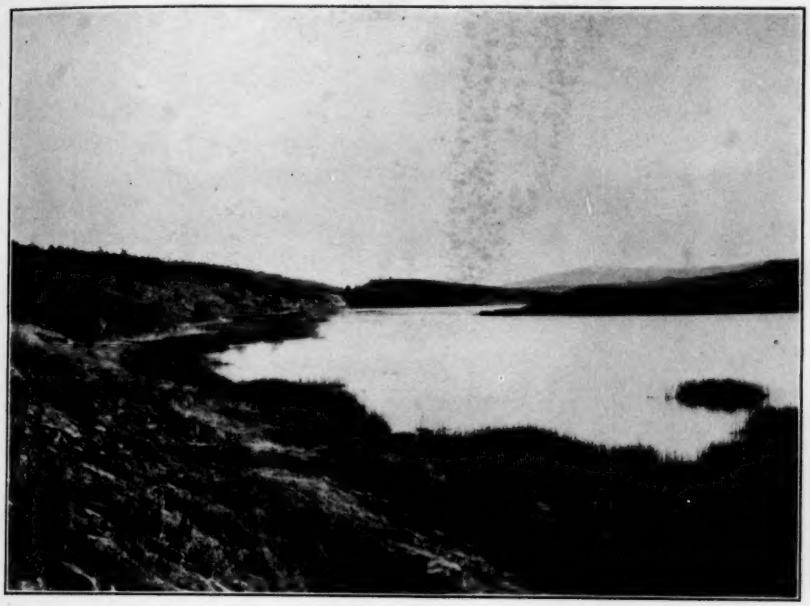
Though a fair number of breeding individuals of various ducks inhabit Lake Burford in summer, it seems from observation, that in addition many drakes come there to molt and spend the summer after their duties of reproduction are completed. Males of the Cinnamon Teal, Mallard and Redhead were the first of these to appear, and, though not present at the time of my departure in large numbers, still it seemed that they were steadily increasing in abundance. A drake Cinnamon Teal, in company with a male Mallard, shot on May 27, had evidently finished breeding as the plumage was worn, the penis and cloaca reduced in size and the testes shrinking. On the following day six drakes of this species were observed in one flock, and from then on they were fairly common. Male Mallards consorting by themselves or with other drakes appeared May 27 and 28, and were seen in small numbers until June 10, after which they were common. One that was molting into eclipse plumage was observed June 4. Drake Redheads began to separate from the females on June 3, and after June 14 were common. In the case first noted of the Mallard and Cinnamon Teal drakes there can be no doubt but that they represented birds that had bred elsewhere, possibly at a lower altitude (though of course there is no means available for proving this) and had come here afterward to molt and spend the summer. No other deduction may be drawn from the facts outlined above, as at the time at which they appeared females of the same species were just beginning to lay at Lake Burford. The presence of such unmated birds as these shows that it is unsafe to rely upon a count of all drakes in arriving at an approximately correct census of the breeding ducks of any given area.[1] It is true that breeding drakes at certain times of the day (usually between 8 and 10 in the morning) are found alone, while the female is absent at the nest depositing an egg; and these drakes usually linger near at hand for a few days after the female has ceased to lay and has begun to incubate. (This statement may be qualified by adding that it is more often

[1]The statements outlined here do not apply to the Ruddy Duck (*Erismatura jamaicensis*) as the drake of that species, like the male Canada goose, usually remains true to his spouse during incubation and the rearing of the young.

true of the "deep water" than of the "shallow water" ducks). These breeding birds however after a little experience may be told readily by their actions and demeanor, and seldom need be confused with those others whose duties of procreation are for this season completed. The mated birds when found alone are not far from the site of the nest, are more alert and watchful at the approach of an intruder, and often call a warning to the female. When flushed they may fly only a short distance and then drop into the water again, and in any case usually circle around and seem loth to leave the neighborhood. In contrast to this the summering drake nearly always seeks the company of others of similar status, so that little bands of these birds, often containing several species, may be found standing about on shore sleeping, preening or feeding. In demeanor these birds are more sluggish and when flushed usually fly off to some safe spot often a considerable distance away. Their entire manner and custom of life is wholly different from that of the bird still in company with his mate.

At Lake Burford these summering male ducks increased steadily in numbers until the time of my departure. Certain points and open beaches were favorite resorts with them, and there I was sure to find little flocks of males alone, or in company with a few pairs of mated birds. By the time when these birds must of necessity lead a sequestered life because of their inability to fly through the molt of their flight feathers, the two prime requisites of food supply and shelter would be present, as cover on the waters of the lake in the form of growths of the two species of *Scirpus* was steadily increasing while the great masses of potamogetons promised abundant food for them.

The lateness of the breeding season among the waterfowl here may be attributed perhaps to the slow development of a proper food supply. Until the first of June food suitable for these birds was far from common in the waters of the lake. A number of Mallards, and a few Cinnamon Teal and Lesser Scaup Ducks that I shot for examination for one reason or another were all thin and poor, and had very little fatty tissue underlying the skin. A female Ruddy Duck was the only individual examined that was fat in any degree. It is possible that this poor physical condition might retard physiologically the sexual maturity of these birds



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1. Growths of tules furnishing shelter for water birds. (Lake Burford, N. M.)
2. Water hole in gully near cabin at Lake Burford.

and so postpone the breeding season until a period of comparative abundance had been reached. It would seem that this scant store of energy must tell heavily on the females who were under the necessity of drawing upon their reserves of strength in producing a number of eggs. The close of the breeding season finding the birds thus reduced brings another call upon their vitality, in the renewal of their covering of feathers. It was observed that female Mallards were renewing their body feathers at the same time that they were mating and laying eggs.

The occurrence of the Lesser Scaup Duck at Lake Burford was of especial interest as, though the birds were present in fair numbers they were not breeding. These ducks were observed first on May 25, when a few apparently were mated. The mating display was observed on several days, and the birds were seen in copulation occasionally during the first week in June. Two pairs that were under observation frequented one area of rushes and the females gave the usual alarm note when I came in sight. Careful search failed to reveal a nest and finally I shot both females, one on June 17, and the second on June 18. Dissection showed that while the ovaries in these two were apparently healthy, as they were clear and normal in color, there was no physiological development in ovary or oviduct, and careful examination showed that the birds had not laid this year nor would they have done so if unmolested. The reason that these ducks remain so far south is puzzling. In many cases such ducks are cripples as I have taken summering birds at such southern localities as Lake Koshkonong, Wisconsin, Minco, Oklahoma, and the Laguna de Guánica, Porto Rico, at the end of the month of May and during the first part of June and have found that they showed the scars of old wounds. Here at Lake Burford, however, the birds were present in fair numbers, and were able to fly without difficulty when approached, and the two females collected showed no sign of injury of any kind. The males observed were all in full handsome plumage. It may be suggested that part at least of these ducks do not breed until they are two years old, and that some of these may remain in southern localities, lacking the physiological incentive for the flight to the breeding ground in the north.

An interesting case of sterility in a female duck was encountered in collecting a small series of Mallards, to be preserved as speci-

mens. On June 15 I had a pair of Mallards under observation for some time and from their actions was certain that they were mated as the female remained constantly near the male and the two had all of the mannerisms of mated birds. A short time after I came nearer and finally shot them both. On dissecting the female I found that the ovary showed little or no development while the ova exhibited the diseased condition known as black atrophy, an affection that is little understood, but one that is known to render birds sterile. The oviduct in this Mallard could be barely distinguished and showed no development whatever, though in healthy breeding females taken at this same time the oviduct was greatly enlarged, and exhibited the condition of turgidity common to the breeding and laying season. The male that accompanied this female was molting rapidly into eclipse and had already lost much of the breeding plumage. On examining the sexual organs in this bird I found the cloacal portion still swollen and enlarged, but the testicular substance degenerating so that it had been resorbed to a point where the testes were shrunken to one-fourth of the full normal size.

The instances outlined here are a further example of the care necessary in allotting ducks as breeding in certain localities simply because of their presence there in breeding season. This would apply especially to more unusual records in extension of range. Further observations on the occurrence of mated sterile females among ducks and other birds are of importance and the question is one that will repay careful investigation.

MIGRATION

At the time of my arrival there was still some movement in migration both among the smaller insect-feeding passeriform species and the larger water birds. Cliff swallows were not observed until May 25, Western Warbling Vireos arrived about May 31, and Orange-crowned Warblers, June 2. Grinnell's Waterthrush was seen on May 23 and 25, and the Pileolated Warbler on May 26 and June 2.

A few observations seem to indicate that Lake Burford is on one of the lines of flight for birds passing to and from the Salt Lake Valley, Utah. Snowy Herons observed at the lake at intervals

from May 23 to June 5, were certainly on their way to the mouth of Bear River, Utah, as that is the only breeding colony of these birds in the interior in this general region. A flock of Franklin's Gulls in full breeding plumage frequented the lake from June 14 to 16, and it may be that these were in passage to the same place as the time of their departure coincided with the arrival of a part of the breeding birds on Bear River; while apparently there is no intermediate region where they may nest. It may be supposed therefore that part of the ducks that come to Lake Burford in the fall come down from the Salt Lake Valley and use this lake as a resting place before passing on farther south. It is probable that this lake is merely one point in a broad line of flight that covers western New Mexico and the most of Arizona wherever water is found.

ANNOTATED LIST OF BIRDS

1. **Colymbus nigricollis californicus** (Heermann). EARED GREBE. The Eared Grebe was the most abundant of the breeding marsh birds at Lake Burford and while the species was common when work was first begun at the lake it increased suddenly in abundance between May 30 and June 1. Many of these Grebes were seen in pairs on my arrival, but until June 2, small flocks containing unmated birds of both sexes were found in certain of the open bays. As the season advanced these birds showed more activity, and after June 5, the Grebes were always found in pairs, that rested on the water with male and female never separated far from one another. Many were seen in the open water, some near shore and others farther out, while other pairs frequented the shelter of the fringing tules. All were tame and showed little fear so that when I remained quiet I had no difficulty in watching them, often at a distance of only twenty or thirty feet. They were without question the most interesting birds on the lake and were continually revealing new habits and mannerisms so that the watcher was certain to be repaid for any time spent in observing them. The displays witnessed during their mating were perhaps of the greatest interest.

The most striking of these courtship displays was one similar to that styled the "Penguin" attitude by Julian Huxley in his studies of similar actions in the Great Crested Grebe of Europe.[1] I was fortunate in witnessing this daily in whole or in part during my stay at Lake Burford. At the beginning of this, one of the most characteristic acts in the courtship of the Eared Grebe, the two birds, male and female, usually rested on the water five or six feet apart. Suddenly the male assumed an attitude fac-

[1]Proc. Zool. Soc. London, 1914, pp. 491–562, 2 plates.

ing the female with crest and cheeks flaring, head erect, neck extended slightly forward, wings half opened with the tips raised so as to display all of the handsome markings to the best advantage. The female then dived, remaining under twelve or fifteen seconds, while the male maintained his position watching intently. As the female emerged she came up slowly a few feet away with head and neck extended until when free of the water she was standing bolt upright on the surface, treading water rapidly, with her whole body exposed. Sometimes she came up facing the male, sometimes with her back toward him and sometimes behind him. On perceiving her he rose at once, assuming the same attitude as that held by his mate, and the two, still bolt upright, advanced slowly toward one another, until finally their breasts touched, when their feet, suddenly moving more rapidly, broke at the surface, making a great boiling in the water. This performance was accompanied by constantly varied trilling and whistling notes. The birds held this upright position for a few seconds with heads turning rapidly from side to side as if pivoted on the neck, then sank slowly down to the usual resting position on the water, and at once began to preen the feathers of the sides of the breast and neck. This ended the display and the birds drifted slowly apart. The performance as described was the completed act. Frequently however after birds has been paired for some time they rested on the water facing each other, then rose at once to the upright position, and touched breasts, while calling excitedly, after which they sank back and began to preen. The boiling, rushing sound made by their feet as their breasts touched could be heard for a long way and often attracted attention to pairs in the open water at some distance that were just completing this display. Sometimes the male continued erect after the female sank back, and might then turn his back to her and travel off across the water for two or three feet. Again the male at times rose in display and the female did not respond when he sank back slowly after a few seconds. In one variation of the action I saw a male emerge very slowly in front of his mate with wings partly raised, submerge, and then rise again. The third time he emerged in the erect position but she did not respond when he sank back again on the water. The entire display was seen at comparatively long intervals but the simplified version in which the two birds merely rose together was observed many times each day. The entire act required from 10 seconds to nearly a minute to complete. As the birds stand bolt erect their resemblance to small penguins while performing this act is both curious and striking.

Another very pretty display was as follows. A pair rested on the water 8 or 10 feet apart and then swam slowly toward one another, suddenly checking to a standstill when their bills almost touched. They remained for a second or two in this position and then both turned half around so that their tails were almost touching, and the birds were facing away from one another. The male then depressed his crest, lowered his head and nodded it slowly back and forth, looking at the surface before him as though

examining a nest and eggs, while both gave a low trilling note that continued for some time and was very pleasing. As the season advanced this action became more and more common, and when nest-building began the male performed in this way over the nest foundation constantly. The female now became more active, frequently rising half erect at short intervals, arching her neck with head bent toward the breast and then giving a sudden quick spring forward, seemingly imitating the action of sliding up on a nest platform.

In another action male and female rose from the water, and, standing half erect with the male slightly behind but with his breast touching the female's side, rushed off across the surface for six or eight feet calling excitedly. At other times a pair lay prostrate and travelled off on the water with necks extended and wings spread and flapping. Or males alone rose on the surface and with neck bent forward, crest and cheeks expanded, and flapping wings, ran along in a straight line or in a semicircle sometimes for a hundred feet. I thought also that part of the love making of these birds took place beneath the surface of the water as mated pairs often dived together and remained below for some time. It was a common thing for a male to follow a female under as she dived and at times males showed attention to females by diving from a few feet away and coming up immediately beside them.

Rival males often threatened one another by half extending their wings and then closing them for two or three times as they faced one another, or ran at each other striking with their bills. The attacked bird in this case usually dived to escape. In their squabbles they seemed often to endeavor to strike the feet of an opponent, apparently a tender place, as the attacked bird always dived. Occasionally I saw one spring clear from the water at another to land on his back and slide off. Females too fought to some extent when their mates paid attention to others, and struck vigorously with their bills, doing more real fighting than did the males, who often merely blustered and seldom really came to blows as the one attacked usually dived avoiding a direct encounter. Preening the sides and breast was a constant accompaniment of any mating display.

On cold, sharp mornings, when the temperature was near freezing, these grebes frequented sheltered bays away from the wind, and floated about on the surface with their backs to the rising sun, the feathers of back and flanks expanded, the wing tips raised, and the whole plumage fluffed to receive the warm rays to the fullest degree. At these times the birds looked as large as Mallards or Gadwall. The sudden change to the usual slim form just before the birds dived was almost startling. Frequently when at rest the birds drew one foot up among the flank feathers, and floated about paddling slowly with the other. Often they stretched after resting, extending first one foot and then the other straight back and free of the water. I saw them feeding by swimming slowly along with neck outstretched, seizing Chironomids floating on the surface film with quick

jabs of their sharp bills. Often as the grebes neared these flies they gave a quick stroke with the feet in order to drive ahead and seize them before they were disturbed by the wave that preceded the bird when swimming at a regular rate.

Though these grebes were paired early, actual nest-building did not start until about June 13, though a few females were seen in Hayden's Lake playing with nesting material as early as the first of June. Nests were begun where the water was from three to five feet deep. The females seemed to do the work of nest construction, dragging up masses of algae to a central point and diving actively for more while the males remained near the nest posturing over it trilling and reaching out as though to aid the female as she approached with building material. A colony of a dozen or fifteen nests was begun at one point in the lower end of the lake, and the grebes were noisy and demonstrative here for several days before actual building begun, displaying constantly and fighting with rivals. The noise and commotion continued as nest construction was started. No completed nests were found nor were any eggs laid up to the time of my departure.

The notes of these grebes were whistled and somewhat varied but were of such a nature that it is difficult to transcribe them successfully to paper. Males were heard occasionally making a curious soughing sound concerning whose origin I was uncertain. Occasionally during the night, especially when the weather was stormy the Grebes called in chorus making a considerable volume of wild sound that carried for a long distance.

After the first of June, when insect life became more abundant, little parties containing from six to fifteen of these grebes came swimming up from the lower bays toward dusk each evening to feed in the great open expanse of water at the northern end of the lake. These bands swam steadily ahead in close formation toward the open water, without stopping to rest. Little flocks travelling a hundred yards or so apart continued to come until it was dark. Occasionally as they passed a single grebe came out from the rushes on either side to join them. Frequently I counted 150 or 175 individuals before it became too dark to see clearly. The broad area of water mentioned proved a trap for many insects that came flying out from the sage grown hills surrounding it, while Chironomids and Ephemerids were emerging constantly from its shallow depths in great numbers. Frequently in the morning I found the water surface strewn with drowning beetles and ants, while gnats were resting everywhere on the surface forming an abundant source of food.

After leaving Lake Burford I visited a lake region at an elevation of nearly 9000 feet on a high plateau in the southern end of the Chuska Mountains. The Eared Grebe was found here also and was nesting in fair numbers on the two lakes known to the Navajos as Be-e-khet-hum-ñez and To-teh-khih. Though these lie at two thousand feet greater elevation than Lake Burford breeding among the grebes was much farther advanced.

On July 1, I examined a colony of about forty nests and found that the young had hatched in about two-thirds of them while the eggs in the remainder were heavily incubated. The nests were grouped in a growth of *Scirpus occidentalis* from twenty to thirty feet apart. They were the usual rounded masses of decaying vegetation built up two inches above the water with a slight hollow in the top to contain the eggs. Some had been partly covered by aquatic vegetation drawn up by the parent birds before leaving, while in others the eggs lay in the open with no attempt at concealment. Apparently the young leave the nest as soon as hatched as though I found broken eggshells in which the membranes were not yet dry, the young were nowhere to be seen. Adult grebes swam ahead of me through the water plants, diving when I came too near, but not seeming greatly alarmed. Often they were accompanied by young ten or twelve days old that swam close behind, almost touching the body of the adult bird or climbed upon the back of the parent to be held beneath the wings while the old bird swam away. Adults were seen feeding these young, calling them up across the water and placing food in their bills. These juvenile birds had a wrinkled space of thickened reddish skin bare of feathers on top of the head.

2. **Podilymbus podiceps** (Linnaeus). PIED-BILLED GREBE.—This species was common at Lake Burford and was breeding. Though part of these birds were pairing when I first arrived some were nesting already and all bred earlier than did the Eared Grebes. Their actions were no less interesting than those of the preceding species but these grebes were somewhat more difficult to watch. Each male had selected a restricted area as his own and though he made excursions occasionally out into the open lake, was usually to be found near one certain place. Usually this was a small opening in the rushes fifteen or twenty feet across, often with a slender line of tules projecting in a point that separated a little inner bay from the open water. Ordinarily the male was found in the slight protection of the slender tules or in the open a short distance outside while his mate lay hidden somewhere within. These birds were continually on the alert and watched every move on the marsh, swimming slowly or resting quietly, always with their short tails pointing up at an angle of 45 degrees to display the white below prominently. They were the only marsh birds of whom the male coots seemed to be afraid, and it was seldom that a coot ventured to attack one, though pugnacious to an extreme toward most other swimming birds, a respect that was well warranted as the grebes were aggressive and savage. These male grebes called at short intervals, listening to others at a distance and frequently answering them. Their notes were loud and sonorous, and in calm weather could be heard plainly across the water for half a mile but could be modulated and controlled also so that though the birds were only a few yards away the sounds seemed to come from a great distance. The most common note was a loud *coh coh coh coh coh coh cow cow cow cow*, the first series of notes increasing

in rapidity as they progressed and the last given more slowly with equal intervals between them. This was varied to *coo-coo-coo-coo-qua, coo-coo-qua, coo-coo-qua* continued for some time, the *qua* note being prolonged and with a curious rising inflection. These calls often were given while the bird was in the open. The head and neck were held erect in calling and as each note was uttered the bill was thrown up. Another note given usually from the shelter of the rushes was a loud laughing *hah hah hah hah hah hah*, that was harsh and raucous to an extreme. In addition to the calls described above they occasionally uttered a peculiar low whistled note.

The mating displays of this species while not as varied as those of the Eared Grebe were strange and interesting. A pair resting quietly in open water sometimes dived and then came up to splatter off for a hundred feet or so, across the surface with flapping wings with the male in pursuit of the female and about ten feet behind. At the close of this the male gave a series of loud sonorous calls. Frequently he nipped off a length of tule stem twelve or fifteen inches long, holding it by one end in his bill, while he swam about or even dived. Again a pair swam toward one another with heads and necks held erect. When about a foot apart they stopped and then swung half around and presented their tails to one another. At the same time the male held his wing tips slightly raised, the feathers of his back elevated and the sides of his neck puffed out while both birds turned the head alertly from side to side, though seemingly they regarded some distant object rather than each other. In a second or two they swung back, facing one another again, continued this turning half around and then back, as though pivoted in one spot, at ten or fifteen second intervals for nearly ten minutes. The male was more regular in turning than the female and she was frequently out of time with him. Finally the female lowered her head while the male continued to display for a few seconds longer, after which the two swam back into the shelter of the rushes.

When at rest these birds spent much time in preening and when feathers were loosened in this process (as many were) they were seized, dabbled in the water and swallowed. Eared Grebes did the same but often tried to shake the feathers free from their bills, usually not swallowing them unless they adhered, though I saw one Eared Grebe discard a feather which was immediately picked up and swallowed by its mate.

The Pied-billed Grebes like the preceding species sunned themselves by resting in sheltered bays with their feathers fluffed out. In doing this they floated with their backs to the sun with the wing tips and feathers well elevated to catch the warming rays so that at a distance they looked very large and bulky.

On June 18, I found a brood of newly hatched young near the lower island in the south lake. As I approached the rushes bordering the shore a female Grebe swam out calling *cuh kow cuh cuh cuh* and at intervals, rising threateningly on the water, made a great boiling noise by treading

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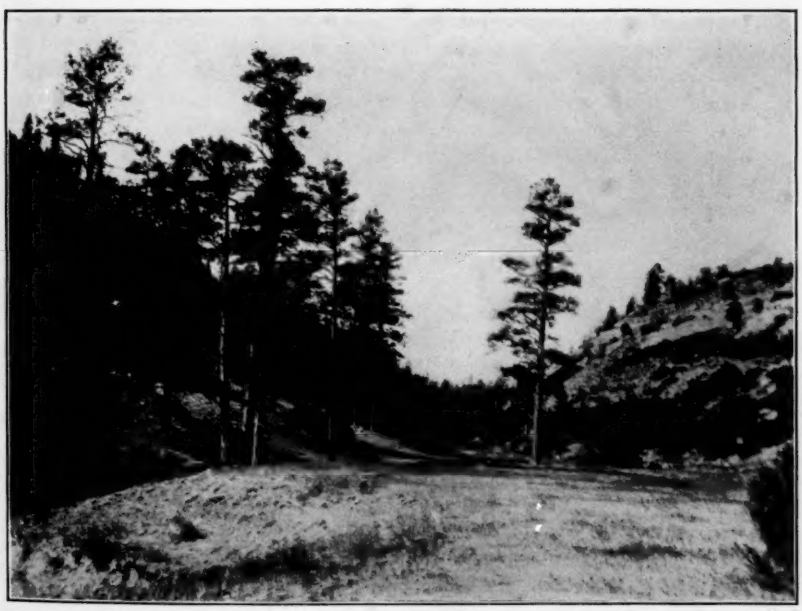

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1. Grove of narrow-leaved Cottonwoods (*Populus angustifolia*) near Lake Burford.
2. Mouth of gulch above Lake Burford showing Yellow Pines (*Pinus brachyptera*).

rapidly with her feet. After a few minutes four young swam out from the shelter of the rushes and joined her, calling with loud whistled notes. She swam slowly away followed by the young who one by one succeeded in clambering onto her back beneath her wing feathers so that soon she was carrying all four. She did not seem to realize this however as several times she rose and shook herself throwing them all into the water again, when they climbed back as rapidly as possible. Finally she dived once carrying the young with her, and then again, leaving them on the surface. The young were able to swim rapidly with the head extended and the base of the neck and forepart of the body entirely submerged in the prostrate attitude common to young grebes. They dived when pursued, and swam away under water, or hanging suspended five or six inches below the surface, watched me intently. One or two soon became tired, and, attracted by the moving boat, swam over and attempted to clamber up the side. One in diving became entangled in algae and had to rise to the surface where it remained helpless. All were able to stay beneath the water for considerable periods but were captured without difficulty. On land they progressed by a series of leaps made with both feet together and wings extended, at each jump falling forward on the breast. The female disappeared after leaving her young, while the male remained in the rushes calling at intervals while I examined them.

These grebes at times were very pugnacious toward the smaller Eared Grebes, driving them about and diving to bite at their feet. At times they were seen in pursuit of Coots and Ruddy Ducks.

3. **Larus delawarensis** Ord. RING-BILLED GULL. Immature gulls of this species were seen on May 24 and 30, and June 5, 6, 7, 14 and 17. One or two were probably present on the western side of the lake during the entire period as the birds were seen there on the occasion of every visit. There was no indication that they were breeding or intending to breed.

4. **Larus franklini** Richardson. FRANKLIN'S GULL.—Fairly common in migration. Two adult birds in full plumage were seen on the western shore of the lake on June 6. On the morning of June 11, fifteen or twenty were scattered about at daylight, resting on the lake in front ofthe cabin. All were in immature plumage but were molting into adult dress. One was taken. On June 13, about twenty more were circling about low over the water so that at first they were taken for terns. On the following day a flock numbering thirty or more in full adult plumage appeared and remained until June 16. They were wild and would not permit near approach. In the evenings they spent much time in aerial evolutions that were beautiful to watch. They worked upward in spirals, alternately flapping and soaring, maintaining a close formation until suddenly all set their wings and rushed downward for several hundred feet making a great roaring noise. Rising again they often separated into three or four smaller flocks that alternately joined and separated,

continuing these antics until dark. Another immature bird was taken on June 15.

5. **Hydrochelidon nigra surinamensis** (Gmelin). AMERICAN BLACK TERN.—Three were seen on June 6, apparently in migration.

6. **Pelecanus erythrorhynchos** Gmelin. AMERICAN WHITE PELICAN, A few were found in migration. Two were observed on May 26, two on May 27, and four on May 28, all resting on shore. It is possible that these birds were on their way north into the Salt Lake Valley. There is no food for them at Lake Burford save the abundant water-dogs (*Amblystoma* sp.).

7. **Mergus americanus** Cassin. AMERICAN MERGANSER.—Found at Lake Burford during migration. A small flock was seen on May 27, and fourteen pairs were observed on May 30. These remained in open water and were very wild. On June 3, four males and two females were found. They flew and left the lake immediately when I came in sight though a long distance away. On June 10, twenty-five males all in full plumage came in, flying in a great V, circled over the lake, and then passed on. An adult male was flushed from the shore on June 15. There are no fish in the lake so that these birds must come here for water-dogs (*Amblystoma* sp.).

8. **Anas platyrhynchos** Linnaeus. MALLARD.—The Mallard was one of the most common species of ducks breeding at Lake Burford and I estimated that forty pairs were preparing to nest here this season. These ducks shifted about from place to place more than any others on the lake, and were seen flying morning and evening. Towards night they came in to feed where openings in the rushes allowed them to reach the shore, where they secured food that had been washed in by the waves. At daylight nearly every morning I found a pair feeding in the spring hole where we secured our water supply. About eight in the morning the birds came out on little open beaches and remained until towards noon, preening, sleeping and resting in the sun.

Mallards are undemonstrative birds and, though they were under observation during much of the time that I was out, it was seldom that I saw any sign of mating display among them. This species has a mating flight, similar to that of the Gadwall, in which two males and one female rise in the air together and fly along rather slowly with the female flying beside first one and then the other of the males. In turn these swing in ahead of her and setting their wings throw up their heads and display their back and wing markings. During this performance the males call constantly while the female quacks at intervals. The whole lacks the dash and speed of the display of the Gadwall and the birds do not change direction so frequently, pursuing a more even course. In another action the female came out on shore and walked about in the short grass with head extended quacking loudly, perhaps simulating a search for a nest site. Sometimes the male accompanied her and sometimes he remained standing quietly on shore.

From their actions I believed that some of the females were laying on May 29. A female that was just beginning to lay was taken on June 7, and birds that had deposited several eggs were shot on June 8, 13, 14 and 15. One taken June 14, had the breast nearly denuded of down. A mated female that was sterile was taken on June 15. While females were at the nest the males remained from a hundred yards to a half mile away standing on shore or swimming in the open water. These males were alert and called instantly at the approach of danger. On one occasion I shot a female for preservation as a specimen as she rose from the border of the lake and her mate came over and swam up and down out of range for several minutes calling anxiously.

As early as May 29, drakes that had finished breeding were banding together and it would seem that they must have bred elsewhere. Following that date these males were found daily, alone or in small flocks, and their number was augmented steadily by others. They were usually found resting or sleeping on shore in open places in company with drakes of other species. A bird that was molting into eclipse was noted on June 4, and from then on birds in changing plumage were common. In this molt they become dull in color first about the head and at the same time lose the recurled upper tail coverts. A male almost entirely in eclipse plumage was seen on June 18.

On June 18, I saw a Mallard's egg that had been stolen apparently by pack-rats (*Neotoma*) as it was found on a small island where there was no other sign of predatory animals. The contents of this egg had been neatly extracted through a hole at one end and the shell laid in a low growth of *Chrysothamnus* with small flat bits of sandstone placed around and over it nearly concealing it. It might seem that this was the work of boys save that the egg was found on an island inaccessible save by boat, and the only boat on the lake was in my possession.

The female Mallards taken were nearly all molting the body plumage and the new feathers that were coming in were very dark. These birds differed from northern and eastern Mallards in the color of the bill also. This was in general dull greenish slate with the base of the maxilla dull orange while the tip of the bill often inclined to dull plumbeous. The naked inter-ramal space was tinged with orange. In one or two there was a dusky blotch on the culmen, but I examined none with the prominent blackish spots on the orange at the base of the bill so prominent in females of this species elsewhere. The toes and tarsi were dull orange. The bill of these females in a way resembled that of the males but was duller in color.

(On May 25 a large very dark-colored duck in company with a mated pair of Mallards passed me several times at close range. It had white bars on either side of the speculum and was much darker in color than the female Mallard, resembling a Black Duck markedly. It is possible that this was a female mallard, but it seemed to have a clear olive green bill

and was larger, thus resembling a male of the Black Duck group (possibly *A. diazi*). No other ducks of this type were observed).

9. **Chaulelasmus streperus** (Linnaeus). GADWALL.—The Gadwall was the most common of the shallow water ducks at Lake Burford, outnumbering the Mallards, as it was estimated that about 60 pairs were breeding there. The birds were all in pairs at the time of my arrival but appeared to nest late as males continued with the females until the time of my departure. They shifted about more or less during the day but in general were distributed all along the lake shore. On one occasion fifty flushed in a flock from a shallow open bay and for a few seconds all were in confusion. At once, however, the flock began to divide, and before they had gone 150 yards all had separated out in pairs and flew off in that manner.

The mating flight of the Gadwall is always interesting and is seen constantly when the birds are on their breeding grounds. Here at Lake Burford opportunities for observing it were excellent. The flight was usually performed by two males and one female. In beginning two males approached a female in the water, calling and bowing. She usually rose at once and flew with a slow flapping flight, mounting in the air with the males in pursuit, calling and whistling constantly. First one and then the other of the males swung in front of her, set his wings, inclined his body upward to show his handsome markings, and, after a few seconds, dropped back again to his former position. Late in the season there was always one of the males who was favored and who displayed more often than the other, flying close to the female, so that in passing his wings often struck hers, making a rattling noise. After a short time the second male often left the pair and returned to the water. The birds frequently mounted until they were 300 yards or more in the air, and darted quickly from side to side, flying now rapidly and now slowly. When the flight was over the birds descended swiftly to the water again. I was never able to ascertain whether there were some extra males about or not, as, though, there were usually two with the female in this flight I found them at other times always in pairs.

The female Gadwall, like the mallards, also came out in the short grass of the shore and walked about with head down, quacking loudly, an action that I took for part of the mating display.

When the birds were in the shelter of the rushes they went through other mating actions of interest. The male swam toward the female bowing by extending his neck until the head was erect and then retracting it, bringing his bill down onto his breast. He then approached pressing his breast against the sides of the female and shoving her easily, first on one side and then on the other, biting her back and rump gently as he did so. After a few seconds she lowered her body in the water and copulation took place with the female entirely submerged save for the crown of her head while half of the body of the male was under water. As the female emerged the male turned immediately to face her and bowed deeply, giving a deep reedy call as he did so.

Gadwall fed in the water by tipping, or occasionally came out on shore to walk along and skim the surface of the mud with their bills as do Green-winged Teal. Like the Mallards they usually spent the morning in resting and sleeping in the sun on some open point.

The call note of the female is a loud quack that is similar to that of the female Mallard but is pitched slightly higher and is not quite so loud and raucous. Considerable experience is required however to distinguish with certainty the calls of the two birds. The male has a loud call like *Kack Kack*, a deep reedlike note resembling the syllable *whack*, and a shrill whistled call.

Females were laying as early as May 29, but no nests were discovered.

10. **Mareca americana** (Gmelin). BALDPATE.—There were two pairs of Wigeon that were apparently nesting at Lake Burford and single males were seen occasionally. The birds were tame and often allowed a close approach.

The mating flight of this duck resembles that of the preceding species, but is performed with more dash and speed. The birds fly swiftly and erratically. The males dart ahead of the females, setting and decurving their wings and throwing their heads up, exhibiting their striking markings to the best advantage.. The female calls *qua-awk, qua-awk* and the males whistle *whew whew* constantly during this performance. Occasionally as a pair swung in low over the water the male darted ahead and, with decurved wings and head thrown up, scaled down to the surface. Two males and a single female invariablly took part in the display flight which began as in the Gadwall by the males approaching the female, bowing and whistling and then following her as she rose in the air.

The birds were observed swimming in open water or feeding in shallow bays by tipping to reach the bottom. They were seen with other ducks sunning themselves on open points in the mornings.

11. **Nettion carolinense** (Gmelin). GREEN-WINGED TEAL.—Five pairs of Green-winged Teal were found at Lake Burford. These birds were found resting on shore with other ducks or feeding by walking about on mud bars like great sandpipers skimming with their bills over the surface. The call note of the males is a musical whistled note resembling *pheep* to an imitation of which they responded read ly. The females call *quack, ka-ack, quack* in rather a high tone. Female birds were apparently laying as they were seen in areas of heavy dead grass and rushes, and called anxiously when I examined these, but no nests were found.

A few drakes that apparently had nested elsewhere appeared on June 14, and from then on they accompanied flocks of males of other species of similar habit, resting with them on open beaches and sandy points.

12. **Querquedula discors** (Linnaeus). BLUE-WINGED TEAL.—A pair of these teal was seen on May 25, and another on June 3. About June 15 they became slightly more common and it was estimated that four pairs were breeding here. Single males appeared on June 11, and

others on June 14, after which they were found regularly in company with other drakes. On June 14 one fed for some time on the open shore in front of a blind where I was concealed. This bird walked along working eagerly in the mud with its bill with all of the mannerisms of the Cinnamon Teal. The call note of the male Blue-wing is a high-pitched *tseef tseef tseef*, entirely different from the notes of the other male teal with which I am familiar.

13. **Querquedula cyanoptera** (Vieillot). CINNAMON TEAL.—The Cinnamon Teal was common at Lake Burford. One pair frequented a marshy area near my boat landing and was seen in the rushes, or resting on shore, constantly through the day. On one occasion two of these Teal were trying to feed along a rush grown shore where a male Coot had taken his stand, but he drove at them savagely time after time whenever they came near, forcing them to take wing and fly a few feet to evade him.

A single drake of this species that was shot on May 27, when in company with a male mallard, had evidently bred this year, and after that date summering males were fairly common. It was supposed that they had bred at a lower altitude and had come up here to spend the summer, as resident birds at Lake Burford were just beginning to lay. On June 6 toward dusk one flock of six males of this species, and later a second flock of seven, came in to the lake high in air, circled about, and alighted in the water. Apparently they had just arrived from a distance.

These single males persisted in paying attention to females already mated, much to the disgust of the paired drakes, who drove them away, bowing at them and chattering angrily. On one occasion six were seen making demonstration toward one female who paid no attention to them, but followed her mate. He swam first at one and then another after each chase returning to his mate and bowing rapidly, while occasionally she bowed to him in return. After a few minutes another mated pair of teal flew by and four of the males flew off in pursuit of them, leaving the first male only two to combat.

The only note that I have ever heard from the male Cinneamon Teal is a low rattling, chattering note that can be heard only for a short distance.

14. **Spatula clypeata** (Linnaeus). SHOVELLER.—The Shoveller was fairly common at Lake Burford and fifteen pairs apparently nested here. On May 27, about forty pairs were feeding on the small lake known as Hayden's Lake but these birds were thought to be in migration as they disappeared at once. On the large lake, Spoonbills were found in shallow bays, in which the shore was open or with only scattered rush growth, where they fed by submerging the head and working through the mud at the bottom.

Males bowed to their mates, in the same way as do the Cinnamon Teal, by extending the neck straight up and then retracting it with the bill held slightly above horizontal. At the same time they often give a low rattling note like *chu-uck chu-uck*. The females usually responded by bowing,

but in a less exaggerated manner, simply jerking the head up and down. The whistling noise that accompanies the start in flight with these birds is made apparently as they gain momentum by beating the sharply pointed wings rapidly after their first spring from the water.

15. **Marila americana** (Eyton). REDHEAD.—The Redhead was a common breeding bird at Lake Burford and 30 pairs were located that seemed settled for the summer. These birds were found mainly in the small bays in the southern part of the Lake where they swam in the open water or rested and slept on shore. Small flocks were seen standing on the open beaches about sandy points every morning sunning themselves or preening their feathers. It was interesting to note that, while the shallow water ducks paid no attention to me unless I came near, the Redheads always waddled into the water and swam out into the open as soon as I appeared even though I might be half a mile away.

The peculiar mating display of these birds seen on several occasions was observed to advantage on June 4. A party of four males and three females were swimming in open water, two of the birds apparently being mated. Suddenly one of the females began to display, approaching one of the males with her head held high, sometimes jerking it up and down and again holding it erect, and at intervals calling *quek que-e-ek*, the last a peculiar rattling note. The male chosen extended his neck, holding his head erect, frequently whirling quickly to show the female his back, or again sank down with his head drawn in while the female bowed before him. At short intervals she opened her mouth and bit at him gently or, if he was swimming, sprang quickly in front of him with her head erect and back partly submerged. She transferred her attentions from one male to another in turn, even approaching the one who apparently was mated. The males showed considerable jealously over these favors and drove each other about in fierce rushes. At intervals they called, the note being a curious drawn out groaning call, resembling the syllables *whee-ough* given in a high tone. As it was given the male sometimes raised his breast, elevated his head and erected his crest. Again he threw his head straight back so that it touched his dorsum above the rump, with the throat up and the bill pointing toward the tail. The bill was then thrown up and head brought again to the erect position as the call was made. The curious actions of the male in calling continued after he was mated, and the strange call note was heard often. Mated males were seen driving savagely at their mates and biting at them while they escaped by diving.

On June 4, a nest containing eight eggs was found in a mass of dead *Scirpus* stems in a clump of tules below the cabin. On June 13 this nest contained 14 eggs and the female had added a considerable amount of down to it. The mate of this bird remained in the open water from a hundred yards to a quarter of a mile from the nest-site but was never seen to go near the nest. The female, who left the nest whenever she heard my boat approaching, always flew out to join him. He remained with her

until June 17, and then disappeared as she had been incubating steadily for three or four days. The nest in this case was built entirely of dead *Scirpus* stems and was deep and well protected. Fluffs of down adhered to the tules all about it so that the site was easily located.

Four single males were observed on June 6, and a flock of twelve was seen on June 8. After this males unaccompanied by females were common. Part were birds that had nested here and a part I believed came from elsewhere.

16. **Marila valisineria** (Wilson). CANVAS-BACK.—There were three pairs of Canvas-backs on the lake that from their actions seemed settled for the summer, but I was unable to find their nests. During the first two days of my stay a female frequented a small cove below the cabin acting as though she was nesting in the rushes but as she was constantly disturbed she finally left this part of the lake. On June 8, a female was seen swimming low in the water away from the rushes but in this case also I was unable to locate a nest.

On one occasion a female swimming after a male, quacked like a female Redhead but in a more subdued flattened tone. The males were silent. On May 27 while watching birds from a shore blind a male Canvas-back came around a point within 40 feet of me. He saw me and eyed me closely but did not seem at all afraid, and swam on past, at intervals dipping the tip of his bill in the water. A few minutes later as I stood up he rose and flew rather heavily, paddling with his feet for about 80 yards before being able to clear the surface entirely. Three pairs of these birds were flushed from a resting place on a rocky beach on June 15.

17. **Marila affinis** (Eyton). LESSER SCAUP DUCK.—There were ten or twelve pairs of bluebills and a few unmated males on Lake Burford during the entire time of my stay but none apparently were nesting. On June 1, I found 25 males and 23 females on Hayden's Lake, a part of them in pairs. These had evidently stopped here in migration as they passed on at once and were not seen again. The summering birds were found in the open bays and in the forenoon were often seen resting and sleeping on shore at open points. Like the Redheads they swam out to open water as soon as I came in sight even though I was a considerable distance away.

The birds were seen in display on several occasions and as in the case of the Redheads the more active part in this fell to the lot of the female. Parts of the mating actions were witnessed on a number of occasions while on June 3 the complete display was seen. A pair rested in open water in front of me when suddenly the female began to swim back and forth with the head erect, frequently jerking the tip of her bill up while the male drew his head in on his breast and lowered his crest, giving his crown a curious flattened appearance. The female turned alternately toward and away from the male, sometimes biting gently at him, while occasionally he responded by nipping at her with open mouth. At short intervals she dove

towards him, barely sliding under his breast, and emerged at once only a few feet away, or at times advanced toward him brushing against him and then turning away. A second male that tried to approach was driven away by quick rushes though the female paid no attention to him. She continued her diving and finally at intervals the male began to dive with her, both emerging at once. As the display continued he joined her under the water more and more frequently and finally both remained below the surface for over thirty seconds where copulation apparently took place. When they emerged the female swam away for a short distance with the male following her. Frequently during these displays the female gave a peculiar rattling, purring call like *kwuh-h-h-h-h* while the males whistled in a low tone.

The female bluebills seemed very anxious when they happened to spy my head in the rushes, and swam back and forth with heads erect and crests raised giving their peculiar calls. The males were more stolid and paid little attention beyond taking care to keep out of gun range. Several pairs were found about certain favorable places for nesting, and I was certain for a time that they were going to breed, a supposition fostered by the displays that I saw continually among them. Careful search however failed to show nests and when finally on June 17 and 18, I shot females that were paired and apparently nesting in points of rushes, I found that, though in normal physical condition, they had not deposited eggs, and, as the sexual organs were not developed, would not have done so this year. As this has been treated fully in the introductory portion of this report it will not be discussed further here save to state that the bluebill apparently should not be listed among the breeding birds of Lake Burford at present, though it seems possible that occasionally pairs may nest there.

Some of the unmated drakes exhibited great regularity in habit. Two in particular were found every morning resting near a certain clump of grass on one sandy point. All of the males observed were in full plumage.

18. **Erismatura jamaicensis** (Gmelin). RUDDY DUCK.—This duck was one of the most common at Lake Burford and it was estimated that 55 pairs were breeding at the lake. When I first arrived part of these birds had selected the areas where they were to spend the summer and were already mated. Others were found in little parties composed of both sexes in places where the rushes were too thin in growth to afford nesting cover, but by June 1, with the increase in growth of the rushes, Ruddy Ducks were distributed around the lake and seemed to be settled for the summer. From observations made here it would seem that part of these birds at least paired and mated after reaching their breeding grounds. Apparently in some areas there were more females than males.

The curious display of the males was seen every day and was observed to the best possible advantage, as frequently birds displayed within 30 feet of me. They seemed to keep up the curious performance constantly

all day long and sometimes displayed for half an hour or more when no females were near. As a matter of fact this action often began whenever I drove the males to open water from the shelter of the rushes. the manner of procedure was as follows. The male rested on the water with tail erect at an angle of 80 degrees. The head was then drawn in and jerked rapidly up and down several times with the bill depressed, so that the tip of the bill struck the side of the breast above the tracheal air sac[1] (present in the male alone) producing a curious clicking sound. The bill tip was gradually lowered until at the last it hit the breast feathers at the water line splashing the water into foam. At the same time the tail was drawn steadily forward past the vertical to an angle of 60 degrees on the opposite side of the arc, so that the tip came within one and one half or two inches of the head. At the close of this action the head was suddenly extended with the mouth open, and the bird emitted a low croak. The tail was then thrown back to the usual position and the bird resumed its normal attitude. In addition during the display the feathers of the crown were elevated at the sides and depressed in the center to form a deep V that was broad in front and more narrow behind. Sometimes birds held the crest thus elevated constantly, and again it was thrown into this form only as the last notes were given, when it was flattened immediately to the normal position. The sounds produced during the display may be represented by the syllables *tick-tick-tick-tickety quek*. The first series is not vocal but is produced by the bill striking the breast above the swollen air-sac, so that this sac is apparently used as a tympanum, a use which explains its development as a secondary sexual character in the male. The last note is vocal and is made up of two distinct elements or sounds uttered synchronously. One of these is a harsh frog-like note that may be represented by the syllable *quok* and the second is slightly drawn out, almost two-syllabled, with a reedy quality resembling the note of the male Gadwall. It was thought that this second note was made in the normal way by the syrinx, and that the first was caused by the expulsion of air from the tracheal sac, as a contraction of the dermal muscle known as the *cucullaris* above the sac was plainly evident through movement of the skin of the neck as the duck extended his head and made this last sound. As this note was given the tips of the wings were elevated for two inches or more, so that it seemed possible that the carpal joint of the wings pressing against the sac (which occupies the whole front of the neck above the breast) aided in expelling air from it.

Males were seen constantly swimming after the females, checking to give the display, and then continuing on. At a distance they resembled absurd little manikins with quick jerky motions controlled by the pulling of strings. At short intervals the males extended their heads on the sur-

[1] cf. Wetmore, A., Proc. U. S. Nat. Mus. Vol. 52, 1917, p. 479; and Condor, Vol. XX, 1918, p. 19.

face and flapping their wings made a quick drive forward for three or four feet making a great boiling in the water with wings and feet. Immediately they resumed the erect position and began the display again. Females were rather shy and when pursued too closely escaped by diving.

Males exhibited considerable jealousy and lowering their tails continually drove at one another, the attacked bird usually diving to escape. Occasionally however he stood his ground when the oncoming male either checked and retreated, or occasionally sprang from the water striking on his opponent's head or back with his broad feet and then sliding off. Often the two remained close together striking at one another with their big feet. This was about the extent of their fighting, at which I was somewhat surprised as young birds when two thirds grown are very pugnacious when handled.

By June 5, a considerable number of Ruddy Ducks were in pairs and swam about when driven from the rushes with the male displaying and the female following him. Females then sometimes gave a curious imitation of the display of their mates, swimming with tails in the air, jerking their heads up and down and then extending the open bill, either without making a sound or at most uttering only a falsetto *qua-er*. This odd mimicry was given at times by females that apparently were unmated. At times some of these female ducks produced quite a rattling noise by striking the tip of the bill on the breast, a sound however that was entirely different from that produced by the male. Males were seen in company with several females as late as June 8. After June 10 the amount of energy spent in display lessened somewhat.

Females were often rather nervous over my presence in the rushes and swam back and forth calling *whap* or *quep* in a curious flat tone. Another note heard from them was *Keow Keow* in a high tone, a one-syllabled call somewhat similar to that of a hen turkey. The breeding season with these birds apparently is late as a female shot on June 18 was not yet laying though the ova were enlarging and the oviduct was about half developed. No nests of this species had been begun at the time of my departure.

These birds in preening the feathers of breast and abdomen stood erect in the water treading rapidly with the feet while they did so. Bluebills and other deep water ducks usually lie over on the back or side in order to dress the feathers of the underparts.

U. S. Biological Survey, Washington, D. C.

(*To be Concluded*)

ADDITIONS TO THE AVIFAUNA OF THE PRIBILOF ISLANDS, ALASKA, INCLUDING FOUR SPECIES NEW TO NORTH AMERICA.

BY G. DALLAS HANNA.

THE Pribilof Islands are perhaps more favorably situated for intensive biological study than any other place in our Arctic possessions. They lie near the center of Bering Sea where there is a very prolific development of marine life. They are the home of the famous Alaska fur seal and the seat of extensive Government establishments for the care of the skins of these animals. Good facilities exist for field collecting in almost all branches of biology and much detailed study might be done with the equipment and laboratories that are maintained there.

Ornithology is especially interesting in the region because of the enormous numbers of sea birds. Various employees of the Government have given the subject more or less attention and several large collections have been made. Whenever even a comparatively small amount of collecting has been done, some unusual visitors have been discovered. The permanent bird population, comprising breeders and regular migrants, numbers but 35 species, of which 21 have been found nesting, while the migrants and accidental stragglers which have been secured or observed have swelled the list to 129 species, including those reported in this paper. Of this number specimens have been collected of all excepting 6, and the U. S. National Museum contains specimens of all which have been collected excepting one. The stragglers come from all directions, at all seasons, and it appears that the end of the list may not be reached until practically all of the avifauna of Northwestern America and Northeastern Asia shall have been recorded. No less than 13 new records for North America have been made here. Some remarkable and unexpected visitors have landed, such as the northern flicker, Japanese cuckoo, Japanese haw finch, Kamchatkan pine grosbeak, brambling, and Kamchatkan sea eagle.

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[1]This list was first given before the Biological Society of Washington and a short reveiw contajning the names of the additions was published in the Journal of the Washington Academy of Sciences, Vol. IX, No. 6. (cf. Auk 1919, p. 443.)

No less remarkable is the absence of some expected species such as the northern raven, a common bird on islands both north and south of these.

It seems most probable that these rare visitors have been lost birds. They seem to have been blown from their regular courses of flight and upon finding the Pribilofs, have landed there at the particular time when some one was prepared to secure the record. It is very probable that many of them would have perished had they not found this land, and the list may be taken as an indication of the great numbers of birds which must be lost at sea. And if the number of species which has been secured bears any relation to the total number which has actually visited the islands then it seems certain that a few years of intensive ornithological study would result in the addition of many more records. This is true because it must be admitted that the unusual species thus far secured have been obtained largely through accident. William Palmer spent the summer of 1890 in collecting birds, but otherwise no one has devoted more than a very small fraction of his time and energy to this work.

I have spent six summers and four winters on the Islands and my last visit extended from June, 1916, to September, 1918. During this period 22 new records for the Islands have been made from specimens collected, five of which represent birds which had not hitherto been reported within the boundaries of North America. One of the latter, the Kamchatkan pine grosbeak, was secured by Mr. A. H. Proctor on St. George Island and has already been recorded.[1] The remaining 21 species are listed below.

In addition to the specimens which represent new records several other very interesting species were collected or observed which seem to deserve mention. Two specimens of the ivory gull and one of Ross's gull were secured on St. George Island. An ancient murrelet and a Savannah sparrow were taken on St. Paul Island for what appears to be the first time although they had been previously reported. A European widgeon, a pomarine jaeger, and a wheatear were taken on the latter island. They had previously been collected but once. Two specimens of the dark

[1]Riley, J. H., Auk, Vol. 34, p. 210, April, 1917.

phase of Rodger's fulmar were preserved. These birds are often seen in the large colonies which breed on the Pribilofs. They seem to mate indiscriminately with light colored birds and in one case a slate-colored downy young was seen which had light colored parents. It does not seem likely that the colonies consist of more than one species. A little wren succeeded in getting from St. George to St. Paul Island in 1914. The species was completely exterminated at the former place during the winter of 1916–17 by gyrfalcons. Another probably from Otter Island was found during the summer of 1918.

In the identification of the specimens and the correcting of names I have received much assistance from H. C. Oberholser, C. W. Richmond, E. A. Preble, and J. H. Riley, to all of whom I wish to express my grateful appreciation.

NEW RECORDS FOR NORTH AMERICA AND THE PRIBILOF ISLANDS.

Eunetta falcata (Georgi). FALCATED TEAL.—A male of this beautiful crested teal was secured on St. George Island, April 18, 1917. Its gorgeous coloration was admired by all who saw it. The native hunters there do not readily distinguish the several species of ducks and this was called by them "Mallard," which name is applied to at least eight separate kinds.

Heteroscelus brevipes (Vieillot). POLYNESIAN TATTLER.—The history of the Polynesian Tattler in North America dates back to October 4, 1911, when a female was secured on St. Paul Island by Mr. M. C. Marsh, then the naturalist of the fur-seal service. The specimen was placed in the National Museum collection without being detected as differing from the wandering tattler. It was discovered by Dr. H. C. Oberholser while he was verifying the identification of a second specimen of the same species, a female collected on St. Paul Island, September 2, 1917, by the writer. Owing to the difficulty of distinguishing the tattlers it may be that the Asiatic form comes across Bering Sea more frequently than the records would indicate.

Thalassoaetus pelagicus (Pallas). KAMCHATKAN SEA EAGLE.—A bird of this species was shot and wounded on St. Paul Island, December 15, 1917, but fell into the sea. Five days later it was picked up on the beach in badly decomposed condition. Enough of the specimen could be saved however to enable the identification to be made in the National Museum. The species has been reported from the Aleutian Islands before, but the record was not accepted by the American Ornithologists' Union because specimens were not secured to make the identification positive. Eagles have been seen on the Pribilofs several times but they probably in most cases belong to the species which Palmer has recorded

(Fur Seals and Fur Seal Islands of the North Pacific Ocean, Pt. 3, 418, 1898) the Northern Bald Eagle, which is abundant on the Aleutian Islands, 200 miles south.

Anthus spinoletta japonicus Temminck and Schlegel. JAPANESE PIPIT.—A female Japanese Pipit was secured on St. Paul Island on August 29, 1916. I have found that pipits are regualar fall migrants at the Islands but heretofore all those collected have been the common North American subspecies, *Anthus spinoletta rubescens.* If a large series were secured it is possible other forms might often be found.

SPECIES NEW TO THE PRIBILOF ISLANDS ONLY.

Brachyramphus marmoratus (Gmelin). MARBLED MURRELET.—A Marbled Murrelet was collected at St. Paul Island, January 13, 1918. It was a very unexpected visitor. The ancient murrelet was recorded from the Islands about 50 years ago and had not been subsequently observed. It was the one which was naturally looked for because it is a common bird in Bering Sea. It was a great surprise therefore that the form which lives south of the Aleutian Islands should be found at the Pribilofs in mid-winter. Later, April 18, 1918, a specimen of *Synthliboramphus antiquus* was secured.

Puffinus tenuirostris (Temminck). SLENDER-BILLED SHEARWATER. A female Slender-billed Shearwater was picked up on the beach of St. Paul Island on June 4, 1918. Another bird was seen shortly after, flying about two miles out at sea. Mr. C. E. Crompton told me that numerous individuals were seen in the vicinity of St. George Island at about the same time.

Chen hyperborea hyperborea (Pallas). LESSER SNOW GOOSE.—A male was secured on St. Paul Island, September 16, 1916. Ordinarily natives are prohibited from using firearms on the Pribilofs during the time when the fur seals are there but on that day a man telephoned to the village from North East Point, twelve miles distant, that there was some kind of a large white bird in a pond near by. Thinking perhaps a swan was seen and knowing the desirability of specimens in order to determine if any Asiatic species visit the Islands he was instructed to shoot the bird and bring it in. But this snow goose is what he brought. Another bird was killed the following year on the same island but since it belonged clearly to the same species and time did not permit of its preparation it was not preserved.

Branta canadensis hutchinsii (Richardson). HUTCHIN'S GOOSE.—A female of this subspecies was shot and preserved on St. Paul Island, May 12, 1918. It is considerably larger than the cackling goose which ordinarily come to the islands each spring and fall, and unlike the latter form there is no sharp demarcation in the coloration of the under parts.

Arctonetta fischeri Brandt. SPECTACLED EIDER.—Three female Spectacled Eiders were secured at St. Paul Island on January 13, 1918, by

native hunters. They did not recognize them as belonging to a separate species from the pacific and king eiders with which they were associated, and since the natives must be depended upon by the collector to a large extent for sea ducks it is likely the birds come more frequently than has been suspected. It would seem natural for individuals to pass in the vicinity of the Pribilofs each year because they have been reported in winter as far south as the Aleutian Islands. One of the birds collected was preserved in formalin for anatomical study.

Melanitta deglandi dixoni (Brooks). WESTERN WHITE-WINGED SCOTER.—Four specimens of the Western White-winged Scoter have been taken on the Pribilofs during the last three years. All were females but this was merely an accidental circumstance because males have been seen. The first specimen was secured on October 30, 1916, at St. George Island by the writer. The next was taken on November 15, 1916, at the same island by Dr. H. P. Adams, formerly physician of the U. S. Bureau of Fisheries. Another was secured at St. George Island on February 4, 1917, and one at St. Paul Island, February 8, 1918, both by the writer.

The species is of regular occurence about the islands in winter. It has been seen on several occasions before any specimens were secured but was not recorded because positive specific identification could not be made. The natives recognize the bird as belonging to a different species from the eiders with which it comes and associates. The birds feed along shore just outside of the surf line in small flocks. The white speculum of the wing makes them excellent targets for the man with the shot gun out after fresh meat in the dim light of the arctic winter morning.

Aristonetta valisineria (Wilson). CANVAS-BACK.—A beautiful male Canvas-back was taken on St. George Island on May 18, 1917. The Pochard, which is difficult for the average hunter to distinguish from this, has been taken on the island but once so both species must be considered as rare visitors. However the natives are inclined to call all ducks "Mallards," when the females have a general resemblance to that species and the males are brightly colored. Thus Pin-tails, Buffle-heads, Golden-eyes, and other river ducks are very apt to be reported as Mallards unless the collector makes a personal examination of each bird secured. Probably the inability to identify the ducks has prevented the securing of many desirable specimens here in the past and delayed the reporting of others until recently.

Clangula clangula americana Bonaparte. AMERICAN GOLDEN-EYE. Two specimens which clearly belong to this subspecies were collected; a male on St. George Island, May 6, 1917; and a female on St. Paul Island January 31, 1918. From a study of female specimens collected in the fall of 1913, it is certain that there is a mingling of the European and American forms in the vicinity of the Pribilofs.

Nettion crecca (Linnaeus). EUROPEAN TEAL.—With the capture of a male and female European Teal on St. Paul Island, May 4, 1918, a per-

plexing question regarding the avifauna was settled. The American teal was recorded in 1898 but no specimens were collected. Subsequently it was found that the European form was frequently found in the Aleutian Islands and it was a question whether the bird seen on St. George by William Palmer in 1890 had not been this. Further complications entered into the case in 1914, when Mr. Edward A. Preble and I collected a female and her unfledged young on St. Paul Island. They could not be identified as the one or the other species. But on May 10, 1917, a fine male of the American form was secured on St. George Island. Then when the European was found we knew definitely that both species migrate through the islands. But until some way is found to distinguish the females of the two forms it will not be known which one stopped on St. Paul to nest in 1914.

Haematopus bachmanii Audubon. BLACK OYSTER-CATCHER.—An adult male of this strange bird was shot on the beach of St. George Island, January 12, 1917. Why it should have come up here in the middle of the winter cannot be stated; it is another instance of the peculiar movements of birds in this region. Other species have done the same thing. The Aleutian Sandpiper goes north regularly in the winter and has been secured on the Islands several times. Once it was found on the drift ice. The Aleutian Song Sparrow came to St. George in the winter of 1913-14. It is possible that these birds arrived in the fall and had remained until they were secured later in the year but it hardly seems possible that so striking a form as *Haematopus* would have escaped detection by sharp native eyes for very long.

There is good reason to suspect that this species has been shot on St. George Island before. One native told me he had given a bird like it to a Doctor Mills several years earlier but that it had spoiled before being prepared as a specimen.

Numenius tahitiensis (Gmelin). BRISTLE-THIGHED CURLEW.—A female bristle-thighed curlew was taken on St. George Island, May 26, 1917.

Although the Eskimo Curlew has been collected on the Pribilofs and the Hudsonian has been reported as having been seen this is the first bird of the genus which has come to my notice during my residence there. It is not likely that either species visits the place except as it may accidentally get out of its regular line of flight.

Archibuteo lagopus sancti-johannis (Gmelin). AMERICAN ROUGH-LEGGED HAWK.—One specimen, unsexed, was secured on St. George Island in the fall of 1917, by Mr. C. E. Crompton of the U. S. Bureau of Fisheries. He has kindly consented to the record being included in this list.

Large hawks are particularly difficult to secure in the arctic tundra country because of the absence of cover for stalking. They have been seen several different times on the Pribilofs, both in spring and fall, during

recent years but in every case they were flying high and of course could not be sufficiently well identified to make a specific record of value. This specimen is the first positive evidence that the species occurs. It is entirely probable that several other large hawks may eventually be secured.

Petrochelidon lunifrons lunifrons (Say). CLIFF SWALLOW.—A Cliff Swallow was shot and skinned on St. Paul Island about June 10, 1918, by a native from whom the specimen was secured. This makes the second species of swallow to be collected on the Islands; the Northern Violet-green was taken in 1914. The barn swallow has also been recorded but not collected.

Plectrophenax hyperboreus Ridgway. MCKAY'S SNOW BUNTING.—Since this species is known to wander from its only breeding place, St. Matthew Island group, to the mainland of Alaska, it has been expected and searched for on the Pribilofs for several years. But it was not definitely known to come until March 30, 1918, when a male in full winter plumage was secured on St. Paul Island. It and a female, which escaped, were found on the top of Rush Hill, the highest point of the Island.

Junco hyemalis hyemalis (Linnaeus). SLATE-COLORED JUNCO.—Two female juncos were secured from a flock of six at North East Point, St. Paul Island, on September 24, 1917. They were feeding about the buildings there, apparently as contented as if they were in the midst of civilization.

Spinus pinus pinus (Wilson). PINE SISKIN—A male Pine Siskin was secured from a flock of twelve found among the North East Point sand dunes, St. Paul Island, on September 24, 1917. The birds seemed to be perfectly satisfied to feed on the seeds of the few ground plants which grow there.

Hylocichla aliciae aliciae (Baird). GRAY-CHEEKED THRUSH.—A female Gray-cheeked Thrush was collected on St. Paul Island, September 9, 1917. It was found feeding on spaded up ground about the Naval Radio Station.

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EXTRACTS FROM NOTES MADE WHILE IN NAVAL SERVICE

BY W T. HELMUTH

In the fall of 1917 the ship on which I served as seaman was assigned to inspection duty on the Atlantic and Gulf coasts of the United States, under Rear-admiral C. McR. Winslow's flag. We left the navy yard at Brooklyn on October 20, 1917, and proceeded up the New England coast as far as Machiasport, Maine, which we reached on November first. We then journeyed south, close inshore, up the Delaware River to Philadelphia, thence to Norfolk, Va., arriving on Thanksgiving day. We left Norfolk on February 23, 1918, proceeding south to Key West, Fla. From here we went directly to Pensacola, Fla.; from Pensacola to New Orleans, up the south pass of the Mississippi; from New Orleans to Galveston, Texas; thence to Port Arthur, Texas, and across the Gulf of Mexico to Tampa, Fla., arriving on April 1, 1918. From Tampa our course took us again to Key West, up the east coast of Florida to Jacksonville, and thence north to Charleston, S. C., stopping at Brunswick and Savannah, Ga.

During this time I had excellent opportunities to study the birds met with offshore, and a few chances to watch land birds on our all too infrequent "liberties" in various places. Some of these notes may be of interest to readers of 'The Auk,' and I append them herewith.

My very sincere thanks are due to Mr. John Treadwell Nichols, of the American Museum of Natural History, who was kind enough to read the original, and perhaps too voluminous, notes, and whose suggestions have been invaluable in the separation of the wheat from the chaff.

I

NOTES FROM NEW ENGLAND COAST NORTH OF CAPE COD, AUTUMN OF 1917.

Across Massachusetts Bay from Provincetown to Boston, late October. Boston toward Machiasport, Me., sixty–sixty-five miles offshore, October 31; to Machiasport and Bar Harbor, in-

shore, November 1; Bar Harbor to Rockland, Me., inshore, November 2; Rockland to Portland, Me., November 4.

Colymbus a. auritus. HORNED GREBE.—In the harbor of Machiasport, November 1, there were nearly 500. [This unusual concentration may indicate that the height of southward migration had reached this point on the coast. J. T. N.]

Alle alle. DOVEKIE.—Three Dovekies seen, Oct. 31, one of which we almost cut down. The wings of these little birds move incredibly fast, and they bear a certain resemblance to tiny Old Squaws in their manner of flight. Six observed on November 1.

November 4, off the Maine coast, my brother counted 83 Dovekies during his hour on the bow look-out, and 103 from the crow's-nest in an hour. We passed through scattered flocks of them all day. They rose before the bows in little flocks, flying to either side, usually for only a short distance before either dropping down into the water again or diving from the air. They flew low over the water for the most part.

Rissa t. tridactyla. KITTIWAKE.—Several flocks of about a dozen each, seen while crossing Massachusetts Bay, late October. Abundant offshore north of Boston and inshore north of Rockland. Common along coast from Rockland to Portland. [The abundance of this species on the Maine coast at this season would seem to indicate that it first moves southward inshore and then V's somewhat outward and also scatters directly outward across the ocean. J. T. N.]

Sula bassana. GANNET.—Going north several were seen crossing Massachusetts Bay. From Boston to Maine they were common, almost all adults, which may indicate that the adults move southward first.

Phalacrocorax carbo. CORMORANT.—On October 31, when well out at sea a large, ragged-looking cormorant was seen, which I identified as *carbo*. Three more of the same species were seen on November 1, in the early morning, far offshore.

Spinus pinus. PINE SISKIN.—On November 2, between Bar Harbor and Rockland, a flock of Siskins and another of Horned Larks came aboard lighting all over the rigging. Many large flocks of Siskins noted during the day, all going north. Mr. Nichols suggests that this northward migrational movement may be accounted for by the deeply-indented, broken coast line of Maine, affording many opportunities for migrational eddies of the type so often observed in similar regions.

II.

WATERFOWL IN THE VICINITY OF DELAWARE BAY, IN LATE NOVEMBER, 1917.

November 24, 1917. At anchor in lower Delaware Bay. Red-breasted Mergansers, Old Squaws, and Scoters in myriads, especially the first-named species. The birds were for the most part flying across the sandy

dunes at Cape Henlopen, or from the bay to the sea. Certain definite pathways seemed to be used by all species, and the birds flew to and from sea indifferently. Their activity continued throughout the day. Weather raw, cold and windy, with a brisk north-west wind blowing.

November 28. From League Island Navy Yard down Delaware River, en route to Norfolk, Va. Large flocks of Mallard, Black Duck and Brant seen along Delaware River. Fifty or sixty Baldpate, a small flock of Redhead, and one flock of fifteen Pintails noticed with the above. In lower Delaware Bay, near Cape Henlopen, at least five hundred Brant were seen. About twenty-five miles to sea, off Cape Henlopen, we ran into a tremendous bed of Scoters. All three species were present, but White-winged Scoters greatly predominating. There must have been at least 20,000 individuals in the flock, which rose in a solid mass, the air being so filled with birds that I fully expected some to fly through our deadlights!

III

BOUND SOUTH, FROM NORFOLK, VA., TO KEY WEST, FLA., FEB. 24 TO 27.

Larus leucopterus. ICELAND GULL.—February 24, 1918. Passed Hatteras at noon, eight miles off Diamond Shoals lightship. Weather cold; sea smooth at Hatteras, becoming lumpy off Cape Lookout and very heavy from there on. Strong wind from south-east. At 6:30 A. M. an Iceland Gull appeared, which followed us all day to a point approximately ninety miles off Cape Fear. Its pure white appearance was striking, and the bird looked distinctly smaller than the numerous Herring Gulls. Bill proportionately smaller, yellow with a slightly cloudy spot on the lower mandible. In some vague way the flight of this bird and its general appearance was quite different from the Herring Gulls. It never associated closely with the others, hanging on the edges of the always following flocks. Occasionally it rested on the water, and we often left it far behind, but it had no trouble in overtaking us, and continued to follow us all day.

Sula bassana. GANNET.—Very common off the capes of the Carolinas, on February 24, at a distance of from fifty to eighty miles offshore, both adults and immature; less common February 25, closer inshore, approaching Savannah, Georgia; extremely abundant in flocks of considerable size fifteen miles off St. Augustine, Fla., February 26; two seen close inshore not far from Palm Beach, February 27. [A sector across the Gannet's late winter range at the conclusion of an unusually severe season. J. T. N.]

Ardea herodias. GREAT BLUE HERON.—On February 25, when about twenty miles off the coast of southern Georgia, a Great Blue Heron, very nearly exhausted, was seen flying south, inshore of us. At intervals the tired bird would try to rest on the water, but upon sinking to its thighs

would resume its weary flapping again, always keeping low near the surface. For the frequency with which this species is met with at sea, nearly always in an exhausted condition, I am inclined to blame their habit, in the south, of feeding on the actual ocean beach, and of their custom of making an extended oversea flight when startled at their fishing. Under such circumstances it would be all too easy for so large a bird—and no very powerful flyer at that—to be blown out in a strong offshore gale.

Land Birds seen at sea. February 25, approaching Savannah, Ga., a Savannah Sparrow appropriately enough, spent a few hours on the boat deck. On February 27, when about six miles offshore near Palm Beach. Fla., a Ruby-throated Hummingbird flew over us and a Yellowthroat was with us all day; it was joined later by a Yellow-Palm Warbler, and these two caused much excitement among the crew, such "tropical looking birds" impressing them with how far south we had come! The presence of the Hummingbird seemed to me unusual at the time, and it seems as though the bird really had no business to be so far north at that time of year, though, as Mr. Nichols pointed out, this species is not uncommonly met with even at long distances from land.

IV

SOME FLORIDA NOTES, MARCH, 1918.

Gavia immer. LOON. March 18, a bed of over 200 seen in the harbor of Pensacola, all swimming in a compact body in one direction,—a novel sight.

Lobipes lobatus. NORTHERN PHALAROPE. March 14, about 175–180 miles off the Gulf coast of Florida, approximately opposite Tampa. Passed eight Northern Phalaropes at noon, and three more about two hours later.

Dendroica discolor. PRAIRIE WABLER. One of the commonest birds in the mangroves on the west end of Key West, Fla. Nichols speaks of this being a common mangrove bird on the west coast of Florida in April.[1]

Early migration of land birds. At Warrington, Fla., near Pensacola, March 18, the thick, low growth along the swampy shore of a small lake was alive with warblers and other small birds, some of which were surely migrants. Nichols noticed no such migration further south in the Keys in 1917, until a much later date. Among others, the following species were seen: Red-eyed Vireo, one; Black and White Warbler, one; Parula Warbler, several; Cape May Warbler, two; Myrtle, Yellow-throated, and Pine Warblers, eight or ten of each. One Wood Thrush and three Blue-gray Gnatcatchers also seen, and a small flock of Carolina Chickadees.

At Hobe Sound, on the southeast coast of Florida, this spring (1919), I observed no movement of migrating warblers, (discounting the departure of winter residents there), at all comparable to this, until the first

[1] Nichalls, J. T., 1918. Bird-notes from Florida; Abstr. Linn Soc., N. Y., No. 30.

week in April; the height of general migration occurring on April 27. No general movement of winter resident species even, was observed there until March 22 (1919), at a point much further south than Pensacola.

From the above it might be supposed that the migration on the northwestern corner of the peninsula begins at a much earlier date than on the east coast, or even on the peninsula proper.

V

NOTES FROM MISSISSIPPI DELTA AND GULF OF MEXICO, LATE MARCH.

March 22, 1918. Bird life on Mississippi Delta. Sailing from a point twenty miles south of South Pass, up the river to New Orleans. When about twelve miles from the Delta we encountered huge beds of Ring-billed and Herring Gulls, chiefly the former, resting on the already turbid and muddy water. This muddy water lay like a film of oil over the clear water below, and our passage separated the film, leaving a clear, limpid wake behind, over which the Herring, Laughing, and Ring-billed Gulls fairly swarmed, as well as several Pelicans and Royal Terns. As far as we could see were banks of gulls, like patches of snow on a muddy plain, and the Pelicans in the distance were beyond all estimation. Saw many Royal Terns and about twenty smaller terns, resembling the Common Tern in general appearance, but too far away to identify.

A flock of Redheads flew over the ship, and we saw several dozen Canvasbacks, which struck me as rather remarkable. Cormorants were abundant in small flocks of from five to eight near the entrance of the river. Saw a few Bonaparte's Gulls also.

As we entered the pass a flock of at least 2000 Pelicans rose from a sandy point beyond the breakwater with a tremendous flapping of wings, and hundreds of ducks started from the reeds on all sides whenever we blew our whistle. Royal Terns were common in large flocks here, as well as in the marshes, remaining so until the character of the country changed decidedly. Brown Pelicans were everywhere, flying along in big strings. These became less and less common as we ascended the river.

Throughout the delta, and for a considerable distance up the river (as far as Point l'Hache), the most evident and abundant land bird was the Boat-tailed Grackle. They were new birds to me and I was struck by their large size, their shrill piercing whistle, the difference between the two sexes, and, in short, their utter dissimilarity to our Purple Grackles. They were present everywhere on the lower river, in huge flocks mostly, but many scattered individuals were seen at the same time. With them were quantities of Red-winged Blackbirds, in scattered colonies.

In the marshes there were ducks by the thousand, and our whistle never failed to scare up a perfect cloud of them. Mallards, Shovelers, both Teal, and Pintail were the commonest species, named in order of abundance. The Pintail, though seen everywhere, were numerically less

common. Numerous Black Duck (sp.?) were seen, some Scaups, probably Lesser Scaups, one flock of about sixty Gadwalls, and three flocks of Baldpates. All these birds were either feeding or resting quietly in the shallow pools between the long strips and patches of high grass and reeds, and from the main-top I could look directly down upon them. It made a splendid sight, and even at the risk of exhausting the patience of the reader I cannot help describing the appearance of the scene as it seemed to an enthusiastic bird lover, to whom many of the species observed were new or unfamiliar.

From my elevated vantage point, the thousands of ducks first attracted attention, but almost immediately one noticed the long strings of flapping Pelicans, the noisy hosts of Grackles, and the bands of Laughing and Ring-billed Gulls that drifted over the marshes and wheeled in our wake, before one's eyes sought out the various other kinds of fowl not quite so obviously in evidence. In the pools were countless Herons, chiefly Little Blues, Louisianas, and Great-Blues, with an occasional Egret. Nearly every pool sheltered eight or nine "assorted Herons," including now and then Night Herons of both species. There were beds of Coots in the larger pools, and sometimes a Pied-billed Grebe or two. In one pool was a flock of some fifteen Greater Yellowlegs. Four Lesser Yellowlegs, some Dowitchers, and many Least or Semipalmated Sandpipers were seen here and there. Hudsonian Curlew were at times not uncommon, and we saw several flocks on the wing.

Small Terns were occasionally seen, perhaps Foster's, three of which flew by uttering harsh rattling cackles and some shrill peeping notes, unlike any of the varied notes of the Common Tern. Large Terns were common, but whether Royal or Caspian I could not tell. Once we passed three great White Pelicans, looming up over the marshes like Norwegian barks with skysails set. Further up the river Killdeer, Spotted Sandpipers and Black Vultures were extremely common. So were mosquitoes! But it seemed to me that if anything was to be seen in lower Louisiana at all it was sure to be found in terrific abundance, and, given the birds, I was only too glad to let the mosquitoes do their worst!

March 28, 1918. Anchored off Sabine Pass, Texas. Approximately 500 Blue Geese, (*Chen caerulescens*), in long strings, flew from the wide marshes on shore directly into the Gulf, many passing over the ship. Their flight is quite different from that of Canada Geese, being more like that of the Brant, and even more like the flapping flight of a Heron, though the wing-beats are rapid. Compared to Canada Geese they are poor flyers, with broader, more rounded wings. Birds with white heads were in the minority.

March 29, 1918. Migrants and waifs at sea. From Sabine Pass to a point south-east into Gulf of Mexico, 100–150 miles offshore. A "norther," with terrific wind and rain. Three Great Blue Herons, (probably Ward's), lit on the main and foremasts, and stayed there all day, balancing

themselves against our 42 degree roll by half extending and lowering their wings to meet the motion. Among other strange visitors at a distance of 125 miles from land were a belted Kingfisher, several Tree Swallows, and many flocks of warblers, which seemed better able to weather the storm than the huge Herons. The only Warblers identified were Myrtles, Parulas, Redstarts, and a female Black-throated Blue. Three Robins came aboard in the evening.

March 30, 1918. Gulf of Mexico, en route to Tampa, Fla. Very heavy weather, with violent squalls, wind varying in direction. A Henslow's Sparrow stayed with us all day, very tame, and ate crumbled hard-tack and drank rain water from the boat-covers. Passed five Louisiana Herons, making heavy weather of it.

March 31, 1918. About 85–95 miles off entrance of Tampa Bay. Several Myrtles, a Parula, a Black and White, and one Prothonotary Warbler flew aboard and spent the morning on the boat-deck, all very tame. Strangely enough, the Myrtles ate bread-crumbs and crumbled hard-tack thrown to them by compassionate sailors!

VI

MIGRANT JAEGERS IN LAST OF MARCH AND EARLY APRIL.

March 14, Bound north. About 180 miles off the west coast of Florida, somewhere between Ft. Myers and Tampa; four Pomarine Jaegers followed us most of the day, the only birds seen with the exception of six or eight Herring Gulls and the Phalaropes mentioned elsewhere.

March 31, to April 10. Cruising in Gulf of Mexico, from Tampa to Key West; and from Key West northwards up the east coast of Florida, rather close inshore (fifteen to twenty-five miles off). Druing this time a few Jaegers were seen every day, numbers being nearly equally divided between the Pomarine and Parasitic species. One or more Long-tailed Jaegers were definitely identified, and two or three doubtful individuals seen at too long range. This latter species, April 8, between Alligator Shoals and St. Lucie inlet. On April 9, approaching Jacksonville, eight or ten Pomarine and about five Parasitic Jaegers followed us northward all day, even up the St. John's river as far as Mayport. According to Cooke practically nothing is known of the northward migration of the Jaegers, and the above notes may be of additional interest on this account.[2]

774 Madison Ave., New York, N. Y.

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[2]Cooke, W. W., 1915, Distribution and migration North Am. Gulls—and their allies: Bull. no. 292 U. S. Dept. Agr.

THE PLUMAGES OF GULLS IN RELATION TO AGE AS ILLUSTRATED BY THE HERRING GULL (LARUS ARGENTATUS) AND OTHER SPECIES.

BY JONATHAN DWIGHT, M. D.

Plates X–XIV

IT is nearly a score of years since I placed on record (Auk, 1901, pp. 49–63) the fact that Gulls and Terns pass through a perfectly definite series of plumages separated by definite moults. This record, modified only a little in details, is as applicable today, as it was then, to the Gulls of the world, and it is only because I have gathered together new characters for determinibg the age of the so-called "immature" specimens that I have again brought up the subject.

While each species has pecularities of plumage at different ages that are specific, it must be remembered that not all species at the same age have equally developed plumages, nor do all birds of the same species at the same age have equally developed plumages. The large species require a longer time to attain adult plumage than do the smaller ones; and there is always a percentage, probbably a small one, in every species of laggards or backward birds that require a longer time in reaching maturity than do the average individuals. These laggards are a source of confusion and have been largely responsible for wrong estimates of age and of the duration of "immature" plumages. They are apparently about one plumage behind their fellows, but in a series of skins taken at random, it is hardly possible to do more than guess the percentage that deviates from the average plumage. At each successive moult, however, birds advance in their plumage towards maturity, but not equally. We do find, however, some very definite characters that are correlated with age, and by combining them, we find that the smaller Gulls attain fully adult plumage at their first postnuptial or annual moult, which is at the beginning of their *second* year, medium sized Gulls, at the beginning of their *third*, and large Gulls at the beginning of their *fourth* year. The percentage of laggards is apparently greatest at the first period of moult and progressively diminishes afterwards.

Another source of confusion in the study of Gulls is due to the fact that different areas of plumage in the same bird advance toward maturity at different paces, although no changes in plumage save fading occur except at periods of moult. The flight-feathers of the wings and the quill-feathers of the tail are moulted but once in the year while the plumzge of the body is moulted twice, so that evidences of immaturity are lost sooner in the body plumage. Nor do discrepancies of development stop here for we may find well developed wings and tail combined with a backward body plumage or vice-versa. But in spite of complications it is possible to group together certain characters so that we have definite plumages representing the average advance made at each period of moult. It may be well to first take up separately each of the several characters by which we may judge the age of a given specimen.

1. *Shape of primaries and rectrices.* Perhaps the most important of the characters is the structural difference in the shape of the primaries and tail-feathers of birds in their first year as compared with those of a second or later year. My attention was directed to this by Mr. H. Ira Hartshorn who in making drawings to scale for me found discrepancies to exist. An examination of specimens of Gulls of the world shows that throughout the first year, and until the first postnuptial or annual moult, the primaries as a rule are more pointed and the rectrices more rounded than in later years. The new second year primaries acquired at this moult, which removes the juvenal wings and tail, have more rounded, broader tips than in the first year, being practically the shape of fully adult feathers. There is some variation, but as a rule in first year birds, the extreme tip appears to be pinched to a point, the outer or distal feather usually showing this pecularity more markedly than the others (see Plate X, fig. 1, and Plate XI, fig. 1).

A similar difference in shape prevails in the tail-feathers of Gulls, first-year or juvenal rectrices being rounded (see Plate X, fig 2, and Plate XI, fig. 2) and replaced at the first postnuptial moult by feathers of the second year which are more or less squared at the tip (see Plate XII, fig. 2). The outer rectrix is perhaps the most diagnostic and as the wings and tail are moulted only once a year the value of these characters is great, for many birds after

the partial prenuptial or spring moult resemble very closely the second-year birds that have not as yet begun this moult.

2. *Pattern of primaries and rectrices.*—Next to shape, the patterns that mark the quill-feathers of the wings and tail are of importance. Every species has a definite adult wing pattern, which, except in the smaller species, is not even foreshadowed in first, and only occasionally indicated in second-year plumages. The same thing is true of the tails. The juvenal or first year primaries in the larger and medium-sized Gulls are as a rule uniformly dingy or black and the second-year primaries that come at the first postnuptial moult scarcely differ although the medium-sized species may have faint indications of "wedges" of a lighter shade on the inner primaries, obscure apical spots or perhaps a dingy "mirror" on the distal quill. The small Gulls during the first year are marked by primaries with more or less dusky areas, but the adult pattern is usually indicated. After the first postnuptial moult then, the new primaries of small Gulls are of adult pattern, those of the larger sized Gulls have a slight suggestion of adult pattern, while those of the largest Gulls at this period hardly differ from the first year primaries. The "wedges" develop sooner than the apical and other spots and the distal primary is the slowest of them all in acquiring adult characters.

Tails develop a little faster than do primaries, but in the largest Gulls three moults are required and often four before all traces of immaturity disappear leaving the tail either pure white or banded as it is in the adults of some foreign species.

3. *Color and pattern of body plumage.*—Under this heading may be included all of the plumage except the remiges and rectrices, and while there is the greatest divergence between the various consecutive plumages, the advance towards maturity in most of the species may be traced through the gradual elimination of the dusky feathers of youth. As the body plumage undergoes two moults each year, the advance is rapid, but at the early moults some brown or dusky feathers are acquired that differ little if any from those that precede them and these immature feathers are often a ready clue to age. The moults of young birds are protracted and the postjuvenal overlaps the prenuptial. Small Gulls at the postjuvenal moult in the autumn acquire a considerable

part of their adult body plumage, and they assume at the first prenuptial moult a plumage that is adult save for wings and tail and finally through the first postnuptial moult they become fully adult. Larger Gulls are quite or very nearly adult in body plumage after the second postnuptial moult but the largest are usually not in full adult dress until after their third postnuptial moult.

4. *Colors of bill and feet.*—The bill is not only rather slow in developing color, but the color often varies between winter and summer. Doubtless there is much more to be learned from fresh birds but museum specimens show indications of immaturity in dark bands and dusky cloudings up to the third and possibly fourth year in the larger species while in the smaller, the time varies from perhaps less than a year to one or two years as the size increases.

The color of the feet and tarsi and eye-ring (the iris too) may be studied successfully only in fresh birds for these parts change color as skins dry so that no clue to their original color remains. In young birds the colors are, as a rule, pale deepening with age to the more brilliant tints or deeper shades of maturity.

It has been my endeavor to show the characters as we find them in *average* birds and it is difficult not to blur the picture with too many details of exceptions. It is no easy matter to pick out typical average birds even with large series to choose from but the accurate sketches by Mr. Hartshorn of wing tips and tails speak for themselves. In explanation of them I will first give a brief diagnosis of the plumages of a small species, Bonaparte's Gull (*Larus philadelphia*) which acquires adult plumage at its first postnuptial moult and then of a large species, the Herring Gull (*Larus argentatus*) which does not acquire adult plumage until its third postnuptial moult, some few specimens retaining slight evidences of immaturity even until the fourth.

Larus philadelphia. BONAPARTE'S GULL.

1. *Natal Down.* Wholly a body plumage and like most Gulls at this stage, the downy chick is whitish or buffy brown clouded with large and small dusky spots.

2. *Juvenal Plumage.* Primaries, pointed, largely white, the tips and outer webs in part, black (Plate X, fig. 1). Tail with rectrices rounded at tips, white, banded subterminally with black (Plate X, fig. 2). Body plumage has much to suggest the adult being chiefly white below but the upper surface is washed and clouded with browns. Bill, pale with dark tip.

3. *First Winter Plumage.* A partial postjuvenal moult in the late fall replaces many of the brown feathers by adult gray ones, but a number of mixed ones may also come in. The juvenal wings and tail remain.

4. *First Nuptial Plumage.* A partial first prenuptial moult in the late winter brings the body plumage a little nearer to that of the adult, the browns being farther diminished.

5. *Second Winter Plumage.* The first postnuptial moult produces the adult plumage except in a very small number of backward birds. The primaries are rounded with the white areas larger (Plate X, fig. 3). The tail has square tipped rectrices and is pure white (Plate X, fig. 4). After this moult, only an occasional bird shows traces of immaturity in slight smudging of the tail or in duskiness of the primaries.

Larus argentatus. HERRING GULL.

1. *Natal Down.* At this stage only body plumage is found which is grayish or buffy, coarsely mottled or clouded with dull clove-brown.

2. *Juvenal Plumage.* Primaries, pointed and dull brownish black. (Plate XI, fig. 1). Rectrices, rounded at tips, dull brownish black, variously but *coarsely* mottled with white, especially on the outer feathers and basally. (Plate XI, fig. 2.) Body plumage, mostly grayish or sooty brown irregularly mottled and barred with buff, the markings coarsest on the upper surface, the lower parts being of a more uniform grayish brown. Bill, black.

3. *First Winter Plumage.* More or less of the body plumage is renewed by a partial postjuvenal moult which may be delayed until well into the winter. The new growth resembles the old, but it usually shows less mottling, the color areas being larger and less broken up. The juvenal wings and tail remain.

4. *First Nuptial Plumage.* A partial prenuptial moult renews some of the now worn and faded body plumage, brown feathers, much like those of the juvenal or first winter stages, growing for the third time. The bill during the winter slowly grows paler at the base, the extent of the black diminishing. The postjuvenal and the prenuptial moults seem to overlap, the former often being delayed and perhaps in some cases suppressed, but as brown feathers mark all renewals during the first year, many specimens of this period appear superficially at least to be in juvenal plumage.

5. *Second Winter Plumage.* The result of a complete first postnuptial moult. Primaries, rounded and dull black, indistinct "wedges"showing

on several of the proximal (Plate XII, fig. 1)). Rectrices, square-tipped and dull black, more *finely* peppered or sprinkled with white than in the first winter. (Plate XII, fig. 2). Body plumage, much like the first winter, but usually whiter below and about the head and with a few gray feathers on the back. Bill, black from tip to nostrils, the base pale and yellowish in dried skins.

6. *Second Nuptial Plumage.* A partial second prenuptial moult renews some of the body plumage, birds becoming much whiter below and grayer on the back. Many of the new feathers, however, are still brown or partially so.

7. *Third Winter Plumage.* A complete second postnuptial moult widens the field for variation because pattern is now pronounced in the primaries (Plate XIII, fig. 1). They are black with more or less white tipping, a "mirror," often with blurred margin, of variable extent is found on the "first" or distal, and gray "wedges" of greater or less extent appear. The tail also shows new pattern (Plate XIII, fig. 2), smudges of black on the white rectrices varying greatly in extent. In some birds the red spot on the bill appears indistinctly but as a rule a dusky band or clouding is found. The body plumage is either adult or there may be a few obscurely dusky areas on the outer surface of the wings.

8. *Third Nuptial Plumage.* A partial third prenuptial moult is hardly noticeable among the body feathers that are already mostly adult.

9. *Fourth Winter Plumage.* After the third postnuptial moult, which is of course complete, it is unusual for evidences of immaturity to remain. The primaries (Plate XIV, fig. 1) are all white tipped and the "mirror" on the first is large and clearly defined, sometimes merging with the white tip, although it is possible that such specimens are still older. A white spot may or may not be found on the next primary, and the "wedges" are more extended but vary with each primary. The tail is now wholly white (Plate XIV, fig. 2). The body plumage is fully adult. The bill is bright yellow with a red spot at angle of mandible.

So it is possible to trace the development of plumages in the Gulls with considerable accuracy and it is a pity to see writers of recent date still clinging to the inadequate term "immature," and to the old-fashioned idea that many years are required to attain adult plumage. With moulting specimens to bridge the gaps between plumages and knowing the characters that develop in sequence much can be learned about age and it is with such material at hand that I have endeavored to show as briefly as the conditions permit, the correlation that exists in the Gulls between plumage and age.

Taking the Gulls of the North American Check List, they may be grouped as follows:

1. Two-year plumage-cycle (like *Larus philadelphia*):—*Xema sabini, Rhodostethia rosea, Larus minutus, Larus franklini, Larus atricilla, Rissa brevirostris* and *Rissa tridactyla.*

2. Three-year plumage-cycle:—*Larus heermanni, Larus canus, Larus brachyrhynchus, Larus delawarensis* and *Pagophila alba.*

3. Four-year plumage-cycle (like *Larus argentatus*):—*Larus californicus, Larus vegae, Larus affinis, Larus occidentalis, Larus schistisagus, Larus marinus, Larus nelsoni, Larus kumlieni, Larus glaucescens, Larus leucopterus* and *Larus hyperboreus.*

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THE SUBSPECIES OF BRANTA CANADENSIS (LINNAEUS)[1]

BY H. S. SWARTH

IN the January, 1920, issue of 'The Auk' (pp. 94–102) Mr. J. D. Figgins has a paper on "The Status of the Subspecific Races of *Branta canadensis.*" This paper is devoted in large part to severe criticism of a publication of my own upon the same subject.[2] I could not possibly take exception to Mr. Figgins for differing from me in matters of opinion, nor for publishing his conclusions. I am, however, perfectly justified in feeling resentful at the ungracious wording of his argument. I object to such statements, for example, as that measurements I have taken are unreliable and that I have suppressed such measurements as did not answer my purpose. I object to having statements ascribed to me that I did not make. I object to having statements of mine "interpreted" —I do not think they need it.

Before discussing in detail some of the statements he has made, it is best, perhaps, to give Mr. Figgins' conclusions, then some of my objections to them. He says finally: "It is, therefore, proposed that '*hutchinsi*' and '*occidentalis*' be eliminated as subspecific forms, that *minima* be raised to specific rank and that the occas-

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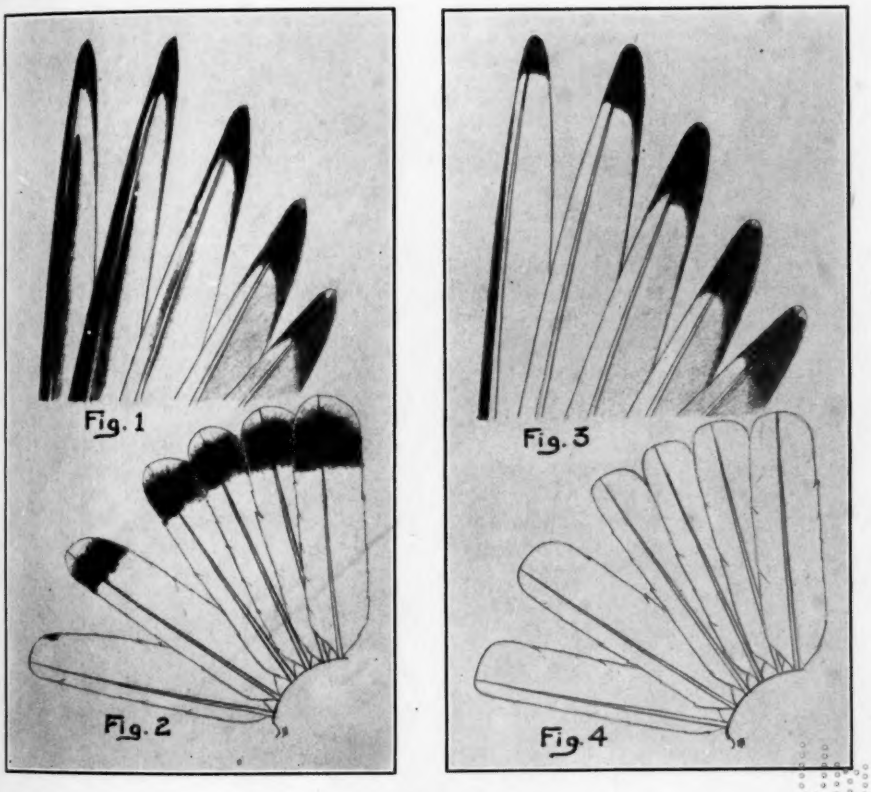
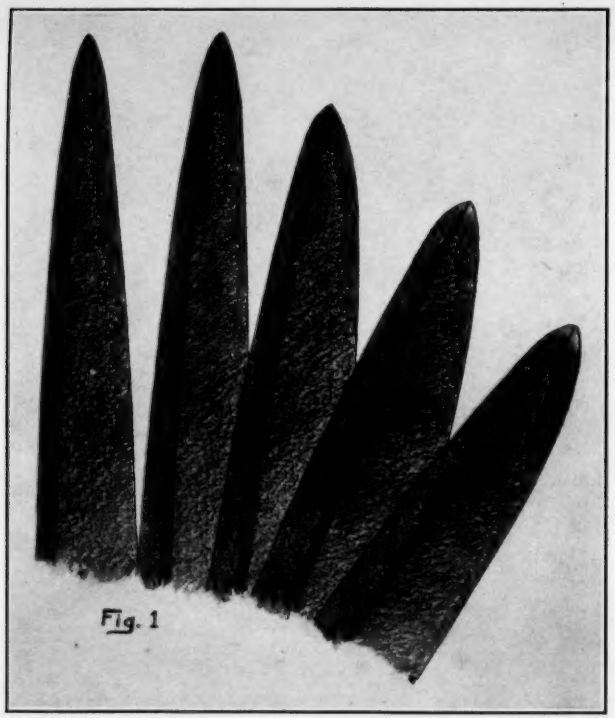
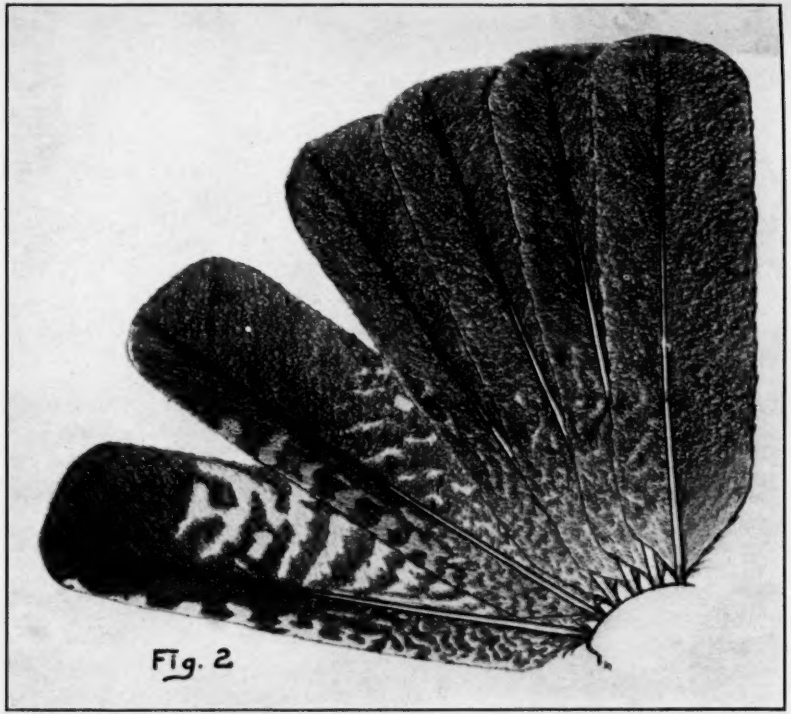
[1] Contribution from the Museum of Vertebrate Zoology of the University of California.

[2] A study of a collection of geese of the *Branta canadensis* group from the San Joaquin Valley, California. Univ. Calif. Publ. Zool., vol. 12, 1913, pp. 1–24, pls. 1–2, 8 text figs.

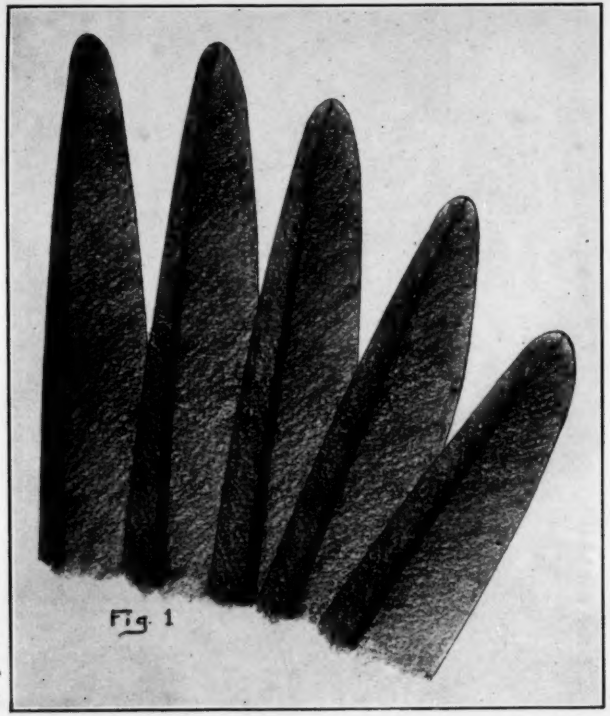


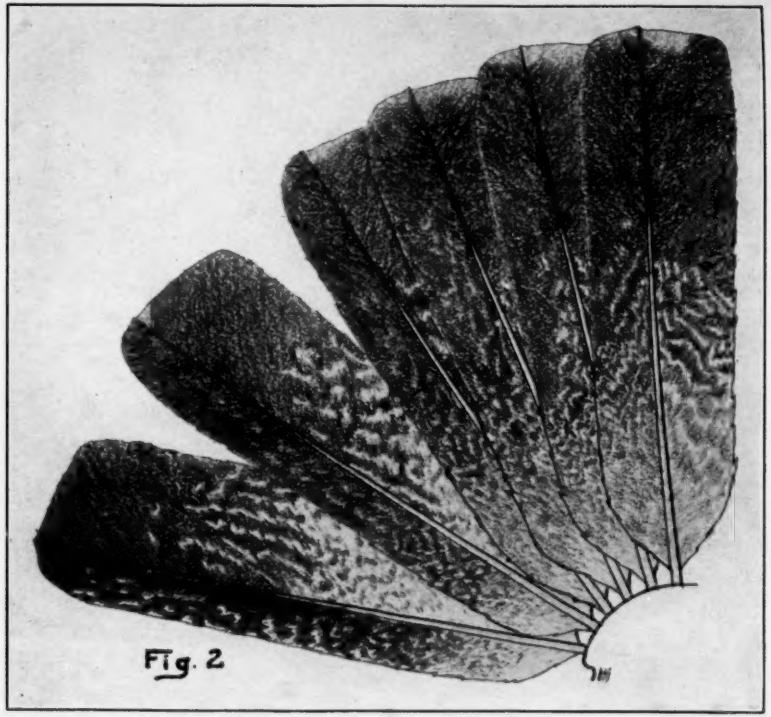
LARUS PHILADELPHIA



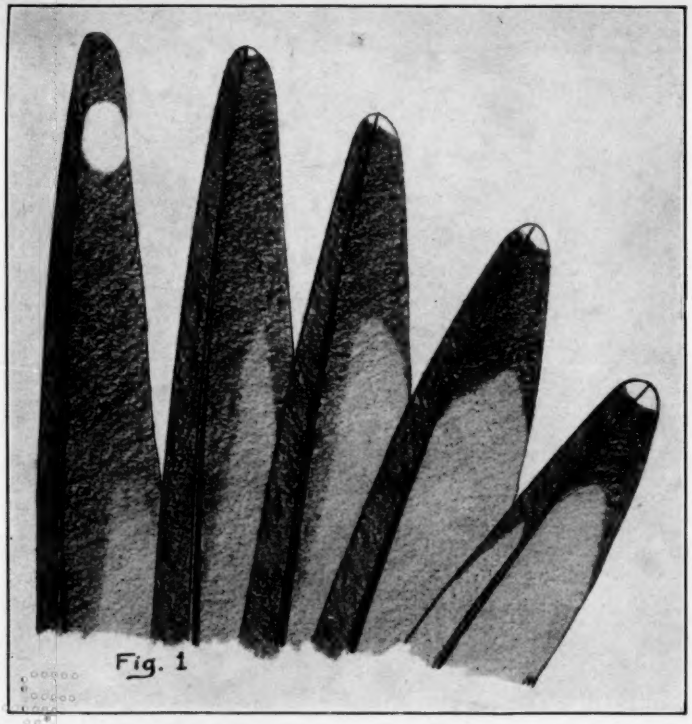


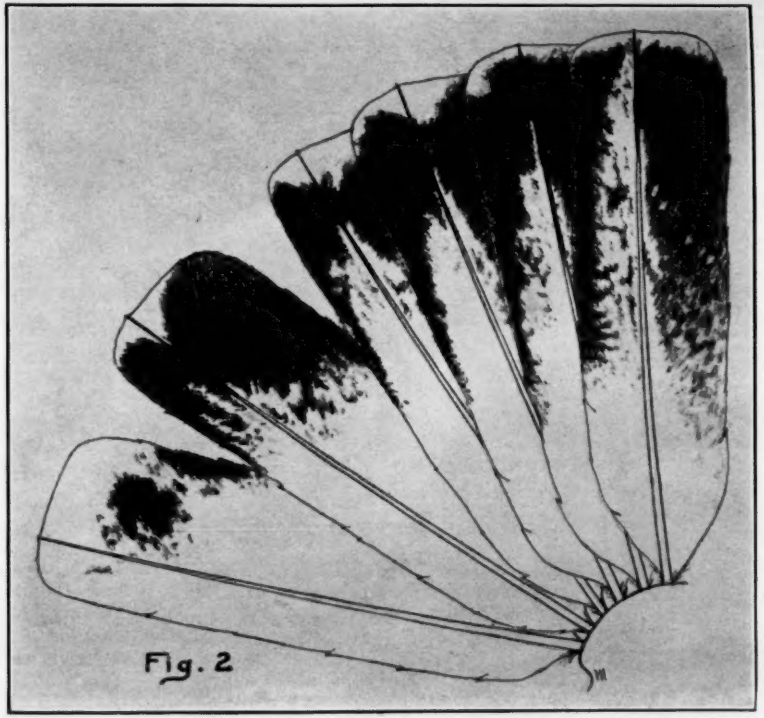
LARUS ARGENTATUS. FIRST YEAR (JUVENAL).



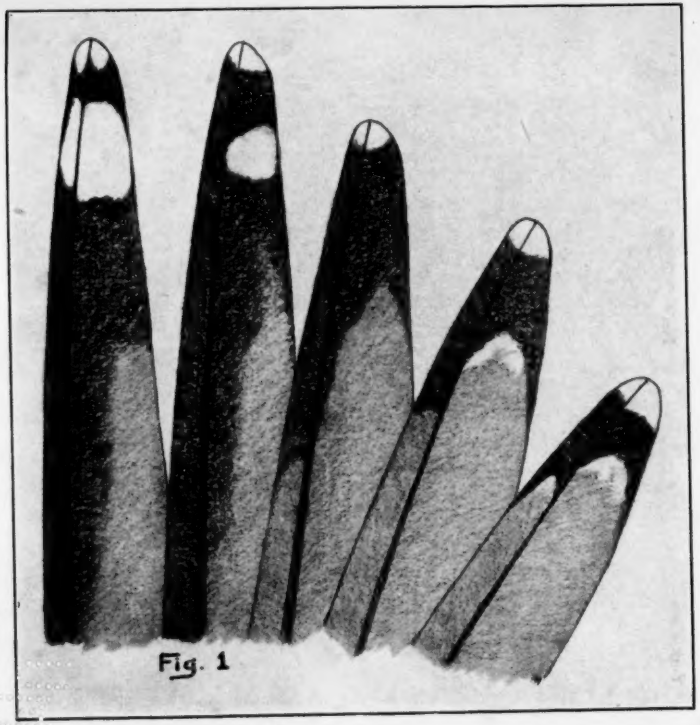


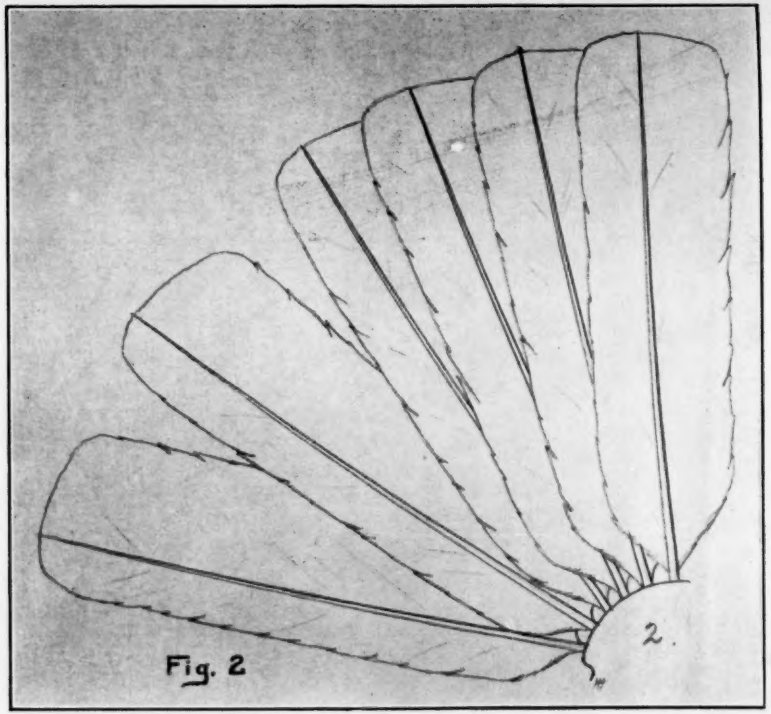
LARUS ARGENTATUS. SECOND YEAR





LARUS ARGENTATUS. (THIRD YEAR).





LARUS ARGENTATUS. (FOURTH YEAR).

ional 'inextricable' examples be recognized as hybrids." Presumably *Branta canadensis* is also to be considered as a species, though he does not say so. At any rate it will be necessary to do so, to supply a second parent for his hybrids.

Now to come to details. "On page three of 'A Study of a Collection of Geese . . .' Swarth states, in a discussion of thirty-six specimens considered as *hutchinsi*, 'twenty-five are males.' Without an explanation of his reasons, he employs but ten of that sex as representative of the differences he describes on page fourteen. It is, therefore, not unreasonable to conclude that the differences he finds in the minimum and maximum measurements of wing, culmen and tarsus, as compared with the findings of other writers, may be due to the elimination of the remaining fifteen males belonging to the series." In plain language, I am accused of juggling the measurements taken to make them accord with my own preconceived ideas.

Mr. Figgins' premise is a false one. The diagnoses of the subspecies given on pages 14–15 are based on *all* the specimens examined. The summaries of measurements (pp. 14–15) are from a limited number (ten in the case of *hutchinsi*), but on pages 16–18 he will find the important measurements of *all* the specimens, all, that is, except a very few that were defective so as not to permit of accurate measurement of one part or another. Futhermore, the extremes as given in the summaries on pages 14–15 are the extremes of all the measurements taken, not from a limited selection. An ordinarily careful reading of my paper would have shown this.

Then, in connection with the subspecies *occidentalis:* "Swarth's contention for a difference in size when compared with *canadensis* is not convincing" (Figgins, l. c., p. 98). My "contention" was that "the maximum of *occidentalis* is below the largest *canadensis*" (Swarth, l. c., p. 7). I did not assert that the size difference between the two was diagnostic. Mr. Figgins has not shown my statement to be erroneous. Then: "The present writer interprets Swarth's description of *occidentalis* as an attempt to justify the continuance of this variation as a subspecies by crediting it as being a more or less resident form inhabiting the Pacific Coast . . ," etc. (Figgins, l. c., p. 98). I think I do not need Mr. Figgins to "interpret" my statements, and I resent an "inter-

pretation" that claims to show an unworthy motive. I stated, in language that seems to me perfectly explicit (Swarth, l. c., p. 10), my belief that *occidentalis* is a recognizable subspecies. I have had no reason since to change my mind.

Another quotation: "Swarth shows that '*hutchinsi*' attains its greatest abundance on the Pacific coast . . . " (Figgins, l. c., p. 101). What I really said was that in California in winter we find "vast numbers of typical *minima*, a lesser number of intergrades, and comparatively few typical *hutchinsi*" (Swarth, l. c., p. 3). One feels rather helpless when he finds his opponent ascribing to him statements exactly the opposite of what he did say. The only assumption permitted me is that Mr. Figgins read my paper too carelessly to judge its contents.

So much for the personal side of the matter, though there are other statements, too, to which I might well take exception. Now, for Mr. Figgins' conclusions, especially as regards the subspecies *occidentalis*.

In the first place, there is no evidence in his paper that he examined a single example of *occidentalis*. If he had any specimens at hand from the coast of southeastern Alaska he does not say so. If he did have, and if he could compare geese from that region with Canada Geese from the interior of the United States and still not appreciate the differences in color, there is nothing more to be said on that score. Others can distinguish these differences without difficulty.

Then, Mr. Figgins confuses two entirely different problems, the characters of the subspecies that inhabits the northwest coast, and the name that should be applied to the race. His argument that some of the characters first ascribed to the subspecies are unreliable is, of course, nothing new and of no importance now that the more stable characters are better understood. The fact that the type specimen of *occidentalis* is not representative of the mode of that subspecies, as now defined, is obviously no reason why the form should not be recognized. I consequently fail to understand why my detailed description of this type specimen "would appear to effectually dispose of *occidentalis* as a subspecific variety" (Figgins, l. c., p. 98).

Mr. Figgins says: "The statement [by Swarth] that 'Of the Alaskan series the Prince William Sound birds are smaller and

darker than those of the Sitkan district . . . ' points rather conclusively to gradation through hybridism." His wording is obscure, but let that pass. Then: "The literature dealing with the distribution of the genus *Branta* fails to take into account the region lying between Prince William Sound and Bering Sea. . . A large part of this territory is ideal breeding ground and to the present writer's personal knowledge, examples of *Branta* are found there in considerable numbers during July, August and September, although no specimens were taken. There are no land barriers that would prohibit these birds crossing from Prince William Sound to Cook Inlet and hence it is not unreasonable to expect that *minima* and *canadensis* and Baird's so-called *occidentalis* interbreed and hence the 'variations' and specimens that intergrade 'inextricably'" (Figgins, l. c., p. 98).

"No specimens were taken!" Yet we are expected to accept as proof of the existence of an extraordinary condition his statement (which I will not deny) of the mere fact that geese are abundant in certain parts of Alaska. It would require the collection of a large series of skins, and the most careful analysis of their peculiarities and of the circumstances under which the birds were taken to carry conviction of the truth of the statement that is made so airily. "Hybridism" has been much used of late to explain things that seem obscure. Mr. Figgins uses the term repeatedly. It is an easy way to wave difficulties aside, but it is an exceedingly difficult thing to prove. Of course on questioning the theory of "hybridism" on a large scale we at once have the Flickers (*Colaptes*) pointed out in triumphant proof, but it may be said that even among these variable woodpeckers there are a great many cases of peculiarities, in color at least, that can not be explained by that theory.

"It appears to be established by several authorities that the breeding range of the representatives of the genus *Branta* overlap, and it is the present writer's belief that *hutchinsi* is a hybrid intergrade between *canadensis* and *minima*" (Figgins, 1. c., p. 101). Here again Mr. Figgins' premise is wrong. There are very few explicit statements of the subspecific character of geese found breeding in the far north. Most observers followed the same course as Mr. Figgins—they saw plenty of geese but "no specimens were taken."

Of course there are "intergrades" in collections—many of them. Is that not one of our tests for subspecies? It is my own main reason for regarding the four forms, *canadensis*, *occidentalis*, *hutchinsi* and *minima*, as subspecies of the one species, *Branta canadensis*.

In the foregoing discussion my comments have pertained mainly to the subspecies *occidentalis*, but Mr. Figgins' contentions regarding *hutchinsi* are, I believe, just as much open to criticism. I submit that Mr. Figgins has not proved his points. Furthermore he has not described his Mississippi Valley specimens sufficiently explicitly to enable anyone else to form an opinion regarding them, nor, for that matter, to know just what Mr. Figgins himself thinks of any particular one.

I hope it is not necessary for me to say that I do not regard my previously published paper on the races of *Branta canadensis* as the last word on the subject. In one respect I admit that it would be difficult to make me change my view—in regard to *Branta c. occidentalis*. I have handled enough specimens of that race, in the field and in the museum, to be fully satisfied of its distinctiveness as a subspecies of *Branta canadensis*, whatever name we may eventually apply to the form. Of *hutchinsi* and *minima*, breeding birds from many points and a study of breeding conditions are admittedly necessary to a full understanding of their status.

I may say that my own views upon this subject have been criticised before. Once, at least, in print, by Brooks (Condor, XVI, 1914, p. 123), and in letters to me by others. In each case, however, the suggested correction was the recognition as species of forms that I regard as subspecies. I still think that, in the lack of sufficient breeding birds of certain of the races, my method of treatment, which is the same as that in the A. O. U. 'Check-list,' is the most reasonable course to follow. That is, to regard *Branta canadensis* as a variable species, divided into four recognizable subspecies, *canadensis*, *occidentalis*, *hutchinsi*, and *minima*.

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DESCRIPTION OF A NEW NORTH AMERICAN DUCK

BY WHARTON HUBER

While collecting ducks south of Las Cruces, Dona Ana County, New Mexico, during the winter and spring of 1915, I noticed numbers of very dark individuals in the flocks of Mallards flying over the sloughs and along the Rio Grande River; while during April and May these ducks were generally seen in pairs.

Upon making inquiries I find these ducks to be fairly common, especially during the late spring and early fall; they are however, just as plentiful during the winter months but are lost sight of in the large flocks of ducks that make their winter home in the Rio Grande Valley of New Mexico.

A careful study of specimens secured seem to indicate that the bird in question is an undescribed member of the Black Duck group and may be described as follows.

My thanks are due to the following for assistance rendered in preparing this paper: Dr. Witmer Stone, Mr. E. W. Nelson, Dr. H. C. Oberholser, Dr. C. W. Richmond and Mr. J. H. Riley.

Anas novimexicana NEW MEXICAN DUCK

Description: Type No. 1928. Collection of Wharton Huber. Adult male; along the Rio Grande River west of Las Cruces, Dona Ana County, New Mexico.

May 7, 1915; Wharton Huber. Forehead and top of head black streaked with pinkish buff. Auriculars and sides of neck pinkish buff streaked with black. Throat pinkish buff unstreaked. Breast black margined and mottled with cinnamon; turning to vinaceous buff on abdomen. Under-tail coverts centially black edged with grayish-white, the outer edges of the feathers margined with cinnamon-rufous. Flanks black-edged and internally streaked with cinnamon and vinaceous-buff. Back, rump and upper-tail coverts black streaked and margined with cinnamon and vinaceous-buff. Primaries mummy brown, darker on the outer webs. Under wing coverts white. Speculum dark dull bluish-violet bordered by a black band then a white band. Bill in life, pyrite yellow. Nail black. Feet and legs in life, Grenadine orange.

The fall plumage is much darker and the edgings of the feather smuch deeper cinnamon. The feathers of the throat are streaked with black.

Measurements: Type; length, 545 mm.; wing, 279; tail 94; exposed culmen, 55; tarsus, 46.

Male, 1786. Coll. Wharton Huber, Mesilla Dam, three miles southwest of Mesilla, New Mexico, April 12, 1915; length, 541 mm.; wing 275; tail, 92; exposed culmen, 57; tarsus, 47.

Male, Belen, New Mexico, December 9, 1917. Collected by Aldo Leopold; length, 550 mm.; wing, 278; tail, 89; exposed culmen, 51; tarsus, 48.

Measurements of three specimens (skins) including the type in mm.

	Length	Wing	Tail	Ex Culmen	Tarsus
Type No. 1928—Adult Male. Along Rio Grande River, west of Las Cruces, New Mexico, May 7, 1915. Coll. by Wharton Huber	545	279	94	55	46
No. 1786—Male. Mesilla Dam, 3 miles s. w. of Mesilla, Dona Ana Co., New Mexico, April 12, 1915. Coll. by Wharton Huber	541	275	92	57	47
Male. Belen, New Mexico, Dec. 9, 1917. Coll. by Aldo Leopold	550	278	89	51	48

*The names of the color used are from Ridgway's "Color Standards and Color Nomenclature."

Habitat: The Rio Grande Valley of New Mexico from Albuquerque south to El Paso, Texas.

225 St. Mark's Square, Philadelphia, Pa.

FIFTH ANNUAL LIST OF PROPOSED CHANGES IN THE A. O. U. CHECK-LIST OF NORTH AMERICAN BIRDS.

BY HARRY C. OBERHOLSER.

THIS is the Fifth Annual List of Proposed A. O. U. Check-List additions and changes in the names of North American birds. Like the First, Second, Third, and Fourth,[1] the present list comprises only ornithological cases—*i. e.*, such as require specimens or the identification of descriptions for their determination—and consists of additions, eliminations, rejections, and changes of names due to various causes. However, only changes known to be the result of revisionary work are included; therefore no mention is here made of changes involved in names in local lists or

[1] For the four previous lists, see THE AUK, XXXIII, October, 1916, pp. 425–431; XXXIV, April, 1917, pp. 198–205; XXXV, April, 1918, pp. 200–217; XXXVI, April, 1919, pp. 266–273. The A. O. U. Committee has not as yet acted on any of these cases.

elsewhere, used without sufficient explanation or not known to be based on original research, of changes or additions queried or but tentatively made, or of the elimination of subspecies by authors who, on general principles, recognize no subspecies.

This list is intended to include everything pertinent up to December 31, 1919, and nothing after that date has been taken. In view of the volume and widely scattered character of current ornithological literature, it is not at all unlikely that some names or changes have been overlooked, and the writer would be very thankful for reference to any omissions, in order that such may be duly given a place in next year's list.

ADDITIONS AND CHANGES IN NAMES.[1]

Gavia viridigularis Dwight becomes **Gavia arctica viridigularis** Dwight, because only a subspecies of *Gavia arctica*. (*Cf.* Bent, THE AUK, XXXVI, No. 2, April, 1919, pp. 238–242.)

Alcella Stone. Raised to generic rank. (*Cf.* Ridgway, Bull. U. S. Nat. Mus., No. 50, VIII, June 26, 1919, pp. 705, 770.) Contains one species now in the genus *Aethia:*

Alcella pygmaea (Gmelin).

Ciceronia Reichenbach. Raised to generic rank. (*Cf.* Ridgway, Bull. U. S. Nat. Mus., No. 50, VIII, June 26, 1919, pp. 705, 767.) Contains one species now in the genus *Aethia:*

Ciceronia pusilla (Pallas).

Endomychura Oberholser. Raised to generic rank. (*Cf.* Ridgway, Bull. U. S. Nat. Mus., No. 50, VIII, June 26, 1919, pp. 704, 751.) Contains two species now in the genus *Brachyramphus:*

Endomychura hypoleuca (Xantus).

Endomychura craveri (Salvadori).

†**Cepphus motzfeldi** (Benicken). *Uria motzfeldi* Benicken, Isis, August, 1824, col. 889 (Greenland). Revived as a species. (*Cf.* Ridgway, Bull. U. S. Nat. Mus., No. 50, VIII, June 26, 1919, p. 742.)

†**Uria ringvia** Brünnich, Ornith. Bor., 1764, p. 28 (Iceland). Revived as a species. (*Cf.* Ridgway, Bull. U. S. Nat. Mus., No. 50, VIII, June 26, 1919, p. 719.)

Pagophila eburnea (Phipps) becomes again **Pagophila alba** (Gunnerus) (*Larus albus* Gunnerus, in Leem's Beskr. Finm. Lapp., 1767, p. 285), since the latter proves to be identifiable. (*Cf.* Ridgway,

[1] Additions to the A. O. U. Check-List, the Sixteenth Supplement, and the First, Second, Third, and Fourth Annual Lists are marked with a dagger (†). Generic (and subgeneric) names so indicated have not hitherto stood in the lists in either generic or subgeneric sense.

Bull. U. S. Nat. Mus., No. 50, VIII, June 26, 1919, pp. 576–577; Oberholser, Proc. Biol. Soc. Wash., XXXII, Dec. 31, 1919, p. 199.)

†**Larus occidentalis livens** Dwight. New subspecies. Dwight, Proc. Biol. Soc. Wash., XXXII, February 14, 1919, p. 11 (San Jose Island, Lower California). Range: Central California to southern Lower California.

Larus brachyrhynchus Richardson becomes **Larus canus brachyrhynchus** Richardson, because but subspecifically distinct from the Old World bird. (*Cf.* Oberholser, The Auk, XXXVI, No. 1, January, 1919, p. 83.)

†**Blasipus** Bruch, Journ. für Ornith., 1853, p. 96 (type, *Larus modestus* Tschudi). Recognized as a genus (*cf.* Ridgway, Bull. U. S. Nat. Mus., No. 50, VIII, June 26, 1919, p. 652), to include one North American species now in the genus *Larus:*

Blasipus heermanni (Cassin).

†**Chroicocephalus** Eyton, Cat. Brit. Birds, 1836, p. 53 (type, *Larus ridibundus* Linnaeus). Recognized as a genus (*cf.* Ridgway, Bull. U. S. Nat. Mus., No. 50, VIII, June 26, 1919, pp. 635–649) to include the following North American species now in the genus *Larus:*

Chroicocephalus atricilla (Linnaeus).

Chroicocephalus franklinii (Swainson and Richardson).

Chroicocephalus philadelphia (Ord).

Larus atricilla megalopterus (Bruch) becomes **Chroicocephalus atricilla** (Linnaeus). (*Cf.* Ridgway, Bull. U. S. Nat. Mus., No. 50, VIII, June 26, 1919, pp. 636–641.)

†**Hydrocoloeus** Kaup, Skizz. Ent.-Gesch. Natürl. Syst. Eur. Thierw., 1829, p. 113 (type, *Larus minutus* Linnaeus). Recognized as a genus (*cf.* Ridgway, Bull. U. S. Nat. Mus., No. 50, VIII, June 26, 1919, p. 649) to include the following North American species now in the genus *Larus:*

Hydrocoloeus minutus (Pallas).

Sterninae becomes **Sternidae,** because raised to family rank. (*Cf.* Ridgway, Bull. U. S. Nat. Mus., No. 50, VIII, June 26, 1919, p. 449.)

Gelochelidon nilotica aranea (Wilson) becomes **Gelochelidon nilotica** (Gmelin). (*Cf.* Ridgway, Bull. U. S. Nat. Mus., No. 50, VIII, June 26, 1919, pp. 479–484.)

Gelochelidon nilotica (Gmelin) becomes **Gelochelidon anglica** (Montagu), because *Sterna nilotica* Gmelin is doubtfully applicable to the species, and its proper name is therefore *Gelochelidon anglica* (Montagu). (*Cf.* Hellmayr and Laubmann, Nomenclator Vögel Bayerns, 1916, pp. 29–30.)

Hydroprogne caspia imperator (Coues) becomes **Hydroprogne caspia** (Pallas). (*Cf.* Ridgway, Bull. U. S. Nat. Mus., No. 50, VIII, June 26, 1919, pp. 462–466.)

Onychoprion fuscatus (Linnaeus) becomes **Sterna fuscata** Linnaeus, because not generically separable. (*Cf.* Ridgway, Bull. U. S. Nat. Mus., No. 50, VIII, June 26, 1919, p. 514.)

Melanosterna anaetheta recognita Mathews becomes **Sterna anaetheta recognita** (Mathews), because not generically separable from *Sterna*. (*Cf.* Ridgway, Bull. U. S. Nat. Mus., No. 50, VIII, June 26, 1919, pp. 486, 512.)

Leptophaethon catesbyi (Brandt) becomes **Leptophaethon lepturus catesbyi** (Brandt), because found to be only subspecifically distinct. (*Cf.* Oberholser, The Auk, XXXVI, No. 4, October, 1919, p. 556.)

Scaeophaethon rubricaudus (Boddaert) becomes **Scaeophaethon rubricaudus rothschildi** (Mathews), so far as North America is concerned. (*Cf.* Oberholser, The Auk, XXXVI, No. 4, October, 1919, p. 557.)

Parasula Mathews is considered to be only a subgenus. (*Cf.* Wetmore, Bull. Mus. Comp. Zoöl., LXIII, No. 4, August, 1919, p. 168.)

Piscatrix Reichenbach is considered to be only a subgenus. (*Cf.* Wetmore, Bull. Mus. Comp. Zoöl., LXIII, No. 4, August, 1919, p. 168).

Mergus americanus Cassin becomes **Mergus merganser americanus** Cassin, because but subspecifically different from *Mergus americanus*. (*Cf.* Millais, British Diving Ducks, II, 1913, p. 89.)

†**Anas platyrhyncha conboschas** Brehm. *Anas conboschas* Brehm, Naturg. Handb. Vögel Deutschl., 1831, p. 865 (Greenland). Recognized as a subspecies. (*Cf.* Hartert, Novit. Zool., XXV, No. 1, May 1, 1918, p. 47.) Range: Greenland.

†**Querquedula discors albinucha** Kennard. New subspecies. Kennard, The Auk, XXXVI, No. 4, October 1919, p. 459 (Grand Chenier, Cameron Parish, Louisiana). Range: Breeds in Louisiana; occurs east to Florida and west to Arizona; in winter south to Mexico, Costa Rica, and West Indies.

†**Eunetta falcata** (Georgi). *Anas falcata* Georgi, Reise Russ. Reichs, I, 1775, p. 167 (Baikal region, Siberia). Recorded as North American from a specimen taken on the Pribilof Islands, Alaska. (*Cf.* Hanna, Journ. Wash. Acad. Sci., IX, No. 6, March 19, 1919, p. 176.)

Marila americana (Eyton) becomes **Marila ferina americana** (Eyton), because considered only subspecifically different. (*Cf.* Millais, British Diving Ducks, I, 1913, p. 14.)

Marila affinis (Eyton) becomes **Marila marila affinis** (Eyton), because regarded only subspecifically different from *Marila marila*. (*Cf.* Millais, British Diving Ducks, II, 1913, p. 68.)

†**Somateria mollissima islandica** Brehm. *Somateria islandica* Brehm, Isis, 1830, col. 998. Recorded from northeastern Greenland. (*Cf.* Millais, British Diving Ducks, II, 1913, p. 3.)

Somateria v-nigra Gray becomes **Somateria mollissima v-nigra** Gray, because found to intergrade with some of the forms of *Somateria mollissima*. (*Cf.* Millais, British Diving Ducks, II, 1913, p. 4.)

Oidemia americana Swainson becomes **Oidema nigra americana** Swainson, because only subspecifically distinct from *Oidemia nigra*. (*Cf.* Millais, British Diving Ducks, II, 1913, p. 55.)

Exanthemops Elliot. Raised to generic rank. (*Cf.* Oberholser, The Auk, XXXVI, No. 4, October, 1919, p. 562.) Its only species, now in the genus *Chen*, therefore becomes

Exanthemops rossii (Cassin).

Casmerodius egretta (Gmelin) becomes **Casmerodius albus egretta** (Gmelin), because found to be only subspecifically distinct from *Casmerodius albus*. (*Cf.* Oberholser, The Auk, XXXVI, No. 4, October, 1919, pp. 557–558.)

Canutus canutus rufus (Wilson) becomes **Canutus canutus** (Linnaeus), because not considered subspecifically distinct. (*Cf.* Ridgway, Bull. U. S. Nat. Mus., No. 50, VIII, June 26, 1919, pp. 233, 238.)

Limnocinclus acuminatus (Horsfield) becomes **Pisobia acuminata** (Horsfield). (*Cf.* Ridgway, Bull. U. S. Nat. Mus., No. 50, VIII, June 26, 1919, p. 266).

Pisobia minutilla subminuta Middendorff becomes **Pisobia subminuta** Middendorff, because considered specifically distinct. (*Cf.* Ridgway, Bull. U. S. Nat. Mus., No. 50, VIII, June 26, 1919, pp. 269, 300.)

†**Pisobia ruficollis** (Pallas). *Trynga ruficollis* Pallas, Reis. Russ. Reichs, III, 1776, p. 700 (Kulussutai, eastern Siberia). Recorded from Nome, Alaska. (*Cf.* Ridgway, Bull. U. S. Nat. Mus., No. 50, VIII, June 26, 1919, p. 292.)

†**Pisobia cooperi** (Baird). *Tringa cooperi* Baird, Rep. Explor. and Surv. R. R. Pac., IX, 1858, p. 716 (Raynor South, Long Island, N. Y.). Considered a good species. (*Cf.* Ridgway, Bull. U. S. Nat. Mus., No. 50, VIII, June 26, 1919, p. 289.)

Pelidna alpina pacifica Coues becomes **Pelidna alpina sakhalina** (Vieillot). (*Cf.* Ridgway, Bull. U. S. Nat. Mus., No. 50, VIII, June 26, 1919, pp. 262–266.)

Calidris leucophaea rubida (Gmelin) becomes **Calidris alba** (Pallas). (*Cf.* Ridgway, Bull. U. S. Nat. Mus., No. 50, VIII, June 26, 1919, pp. 308–314.)

†**Neoglottis** Ridgway. New genus. Ridgway, Bull. U. S. Nat. Mus., No. 50, VIII, June 26, 1919, p. 329 (type, *Scolopax melanoleuca* Gmelin). Includes the following species now in the genera *Glottis* and *Iliornis:*

Neoglottis melanoleuca (Gmelin).

Neoglottis flavipes (Gmelin).

†**Heteractitis brevipes** (Vieillot). *Totanus brevipes* Vieillot, Nouv. Dict. d'Hist. Nat., VI, 1816, p. 410 (no locality). Recorded as North American from a specimen taken on the Pribilof Islands, Alaska. (*Cf.* Hanna, Journ. Wash. Acad. Sci., IX, No. 6, March 19, 1919, p. 176.)

†**Mesoscolopax** Sharpe, Cat. Birds Brit. Mus., XXIV, 1896, p. 371 (type, *Numenius minutus* Gould). Recognized as a genus. (*Cf.* Ridgway, Bull. U. S. Nat. Mus., No. 50, VIII, June 26, 1919, p. 410). Includes the following species now in the genus *Phaeopus:*

Mesoscolopax borealis (Forster).

Squatarola squatarola cynosurae Thayer & Bangs becomes **Squatarola squatarola** Linnaeus. (*Cf.* Ridgway, Bull. U. S. Nat. Mus., No. 50, VIII, June 26, 1919, p. 79.)

Charadrius hiaticula septentrionalis (Brehm) becomes **Charadrius hiaticula** Linnaeus. (*Cf.* Ridgway, Bull. U. S. Nat. Mus., No. 50, VIII, June 26, 1919, pp. 120–124.)

Elseya dubia (Scopoli) becomes, so far as North America is concerned, **Charadrius dubius curonicus** Gmelin, because not generically separable from *Charadrius*, and because subspecifically different from *Charadrius dubius dubius*. (*Cf.* Oberholser, The Auk, XXXVI, No. 4, October, 1919, p. 559.)

Leucopolius alexandrinus nivosus (Cassin) becomes **Charadrius nivosus nivosus** (Cassin), because specifically different from *Charadrius nivosus*, and not generically distinct from *Charadrius*. (*Cf.* Ridgway, Bull. U. S. Nat. Mus., No. 50, VIII, June 26, 1919, pp. 136–137.)

†**Charadrius nivosus tenuirostris** (Lawrence). *Aegialitis tenuirostris* Lawrence, Ann. Lyc. Nat. Hist. N. Y., VII, 1862, p. 455 (near Guantanamo, Cuba). Revived as a subspecies. (*Cf.* Ridgway, Bull. U. S. Nat. Mus., No. 50, VIII, June 26, 1919, p. 139.) Range: southeastern United States, south in winter to Paraguay.

Ochthodromus wilsonius (Ord) becomes **Pagolla wilsonia wilsonia** (Ord), because generically distinct from **Eupoda asiatica** (Pallas). (*Cf.* Oberholser, Trans. Wis. Acad. Sci., Arts, and Letters, XIX, pt. 1, Dec. 30, 1918, p. 520.)

†**Pagolla wilsonia beldingi** Ridgway. New subspecies. Ridgway, Bull. U. S. Nat. Mus., No. 50, VIII, June 26, 1919, p. 112 (La Paz, Lower California). Range: Pacific Coast of America, from Lower California to Peru.

Podasocys montanus (Townsend) becomes **Eupoda montana** (Townsend) because not generically separable from the type of *Eupoda* Brandt. (*Cf.* Oberholser, Trans. Wis. Acad. Sci., Arts, and Letters, XIX, pt. 1, Dec. 30, 1918, p. 516.)

Arenariinae becomes **Arenariidae,** because raised to family rank. (*Cf.* Ridgway, Bull. U. S. Nat. Mus., No. 50, VIII, June 26, 1919, pp. 25, 42.)

Haematopus frazari Brewster becomes **Haematopus palliatus frazari** Brewster, because only subspecifically separable. (*Cf.* Ridgway, Bull. U. S. Nat. Mus., No. 50, VIII, June 26, 1919, pp. 28, 37.)

Asarcia Sharpe, Cat. Birds Brit. Mus., XXIV, 1896, pp. 68, 86 (type, *Fulica spinosa* Linnaeus). Raised to generic rank. (*Cf.* Oberholser,

Proc. Biol. Soc. Wash., XXXII, Dec. 31, 1919, p. 200.) The North American forms are:

Asarcia spinosa gymnostoma (Wagler).

Asarcia spinosa violacea (Cory).

Tachytriorchis Kaup. Raised to generic rank. (*Cf.* Oberholser, The Auk, XXXVI, No. 4, October, 1919, pp. 567–568.) Its only North American species, now in the genus *Buteo*, therefore becomes

Tachytriorchis albicaudatus sennetti (Allen).

Archibuteo Brehm becomes a subgenus of *Buteo* Lacépède, because not trenchantly separable. (*Cf.* Hartert, Hand-List Brit. Birds, 1912, p. 115; Vögel paläarkt. Fauna, Heft IX [Band II, Heft 3], October, 1914, pp. 1114, 1128–1131; Oberholser, The Auk, XXXVI, No. 3, July, 1919, pp. 420–421). The North American forms of *Archibuteo* will therefore now stand as

Buteo lagopus sanctijohannis (Gmelin).

Buteo ferrugineus (Lichtenstein).

†**Thallasoaetus pelagicus** (Pallas). *Aquila pelagica* Pallas, Zoogr. Rosso-Asiat., I, 1811, p. 343, pl. (islands between Kamchatka and America). Recorded as North American from a specimen obtained on the Pribilof Islands, Alaska. (*Cf.* Hanna, Journ. Wash. Acad. Sci., IX, No. 6, March 19, 1919, p. 176.)

†**Melanerpes erythrocephalus erythrophthalmus** Silloway. *Melanerpes erythrophthalmus* Silloway, Bull. Fergus County Free High School, No. 1, 1903, p. 36 (Lewistown, Fergus Co., Montana). Revived as a subspecies. (*Cf.* Oberholser, Canadian Field-Naturalist, XXXIII, No. 3, Sept. (Oct. 4) 1919, p. 48.)

†**Frugilegus** Selys-Longchamps (Faune Belge, I, 1842, p. 68; type, *Corvus frugilegus* Linnaeus). Recognized as a genus. (*Cf.* Oberholser, Proc. Biol. Soc. Wash., XXXII, June 27, 1919, p. 141.) Includes one North American species now in the genus *Corvus:*

Frugilegus frugilegus (Linnaeus).

Agelaius phoeniceus richmondi becomes, so far as North America is concerned, **Agelaius phoeniceus megapotamus** Oberholser. New subspecies. Oberholser, Wilson Bull., XXXI, No. 1, March, 1919, p. 20 (Brownsville, Texas). Range: Texas to northern Vera Cruz, Mexico.

Quiscalus quiscula versicolor Vieillot becomes **Quiscalus quiscula ridgwayi** Oberholser. New subspecies, Oberholser, The Auk, XXXVI, No. 4, October, 1919, p. 552 (Washington, D. C.). Range: middle eastern United States.

Passer domesticus hostilis Kleinschmidt becomes **Passer domesticus domesticus** (Linnaeus), because not subspecifically distinct. (*Cf.* Witherby, Pract. Handbook Brit. Birds, pt. II, 1919, p. 101.)

†**Hypocentor** Cabanis, Mus. Hein., I, 1851, p. 131 (type, *Emberiza aureola* Pallas). Recognized as a genus. (*Cf.* Oberholser, The Auk,

XXXVI, No. 2, April, 1919, p. 286.) The only North American species is:

Hypocentor rusticus (Pallas).

†**Passerculus rostratus halophilus** (McGregor). *Ammodramus halophilus* McGregor, The Auk, XV, No. 3, July, 1898, p. 265 (Abreojos Point, Lower California). Reinstated as a subspecies. (*Cf.* Oberholser, Ohio Journ. Sci., XIX, No. 6, April (May) 1919, p. 353.) Range: southern half of western coast of Lower California.

Centronyx Baird, Rep. Explor. and Surv. R. R. Pac., IX, 1858, p. 440 (type, *Emberiza bairdii* Audubon). Raised to generic rank. (*Cf.* Oberholser, Proc. Biol. Soc. Wash., XXXII, June 27, 1919, p. 141.) The only species therefore becomes

Centronyx bairdii (Audubon).

Passerherbulus leconteii (Audubon) becomes **Passerherbulus caudacutus** Latham (*Fringilla caudacuta* Latham, Index Ornith., I, 1790, p. 459), because antedated by this name. (*Cf.* Oberholser, Proc. Biol. Soc. Wash., XXXII, April 11, 1919, p. 47.)

†**Thryospiza mirabilis** Howell. New species. Howell, The Auk, XXXVI, No. 1, January, 1919, p. 86 (Cape Sable, Florida). Range: extreme southern Florida.

Spizella monticola (Gmelin) becomes **Spizella arborea** Wilson (*Fringilla arborea* Wilson, Amer. Ornith., II, 1810, p. 123, pl. XVI, fig. 3; eastern Pennsylvania), since *Fringilla monticola* Gmelin is a synonym of *Zonotrichia leucophrys*. (*Cf.* Oberholser, Proc. Biol. Soc. Wash., XXXII, June 27, 1919, p. 139.) The subspecies of the Tree Sparrow will, therefore, stand as follows:

Spizella arborea arborea (Wilson).

Spizella arborea ochracea Brewster.

†**Junco oreganus pontilis** Oberholser. New subspecies. Oberholser, Condor, XXI, No. 3, June 6, 1919, p. 119 (El Rayo, Hanson Laguna Mts., northern Lower Calif.). Range: Hanson Laguna Mountains, Lower California.

Junco mearnsi townsendi Anthony becomes **Junco oreganus townsendi** Anthony, because found to be subspecifically connected with *Junco oreganus*. (*Cf.* Oberholser, Condor, XXI, No. 3, June 6, 1919, p. 120.)

Junco mearnsi insularis Ridgway becomes **Junco insularis** Ridgway, because considered to be a distinct species. (*Cf.* Miller, The Auk, XXXVI, No. 2, April, 1919, p. 296.)

†**Melospiza melodia semidiensis** Brooks. New subspecies. *Melospizia* [sic] *cineria* [sic] *semidiensis* Brooks, Proc. New Engl. Zoöl. Club, VII, Nov. 4, 1919, p. 27 (North Semidi Island, Semidi Islands, Alaska.

†**Pipilo fuscus aripolius** Oberholser. New subspecies. Oberholser, Condor, XXI, No. 5, Sept. 30, 1919, p. 210 (San Pablo, Lower Calif.). Range: middle Lower California.

Pipilo crissalis crissalis (Vigors) becomes **Pipilo fuscus crissalis,** because found to be only subspecifically distinct. (*Cf.* Oberholser, Condor, XXI, No. 5, Sept. 30, 1919, p. 211.)

Pipilo crissalis senicula Anthony becomes **Pipilo fuscus senicula,** because found to be only subspecifically distinct. (*Cf.* Oberholser, Condor, XXI, No. 5, Sept. 30, 1919, p. 211.)

Pipilo crissalis carolae McGregor becomes **Pipilo fuscus carolae** McGregor, because found to be only subspecifically distinct. (*Cf.* Oberholser, Condor, XXI, No. 5, Sept. 30, 1919, p. 211.)

Zamelodia melanocephala melanocephala (Swainson) becomes, so far as North America is concerned, **Hedymeles melanocephalus papago** Oberholser. New subspecies. Oberholser, THE AUK, XXXVI, No. 3, July, 1919, p. 412 (Santa Cruz River, west of Patagone Mts., Arizona).

Zamelodia melanocephala capitalis (Baird) becomes **Hedymeles melanocephalus melanocephalus** (Swainson), because found to be the typical race. (*Cf.* Oberholser, THE AUK, XXXVI, No. 3, July, 1919, pp. 408–411.)

Piranga erythromelas (Vieillot) becomes **Piranga olivacea** (Gmelin). (*Tanagra olivacea* Gmelin, Syst. Nat., I, ii, 1789, p. 889; Hempstead, Long Island, N. Y.) because the latter name has priority. (*Cf.* Oberholser, THE AUK, XXXVI, No. 4, October, 1919, pp. 575–576.)

Piranga hepatica hepatica Swainson becomes, so far as North America is concerned, **Piranga hepatica oreophasma** Oberholser. New subspecies. Oberholser, THE AUK, XXXVI, No. 1, January, 1919, p. 74 (Pine Canyon, Chisos Mts., Texas). Range: southwestern United States to central Mexico.

†**Lanius ludovicianus grinnelli** Oberholser. New subspecies. Oberholser, Wilson Bull., XXXI, No. 3, Sept., 1919, p. 87 (San Fernando, Lower Calif.). Range: north central Lower California.

Dendroica bryanti castaneiceps Ridgway becomes **Dendroica erithachorides castaneiceps** Ridgway, because *Dendroica bryanti* Ridgway proves to be but a subspecies of *Dendroica erithachorides* Baird. (*Cf.* Oberholser, THE AUK, XXXVI, No. 1, January, 1919, p. 85.)

†**Anthus spinoletta japonicus** Temminck and Schlegel. *Anthus pratensis japonicus* Temminck and Schlegel, Fauna Japonica, Aves, 1850, p. 59, pl. 24 (Japan). Recorded as North American from a specimen taken on the Pribilof Islands, Alaska. (*Cf.* Hanna, Journ. Wash. Acad. Sci., IX, No. 6, March 19, 1919, p. 176.)

Salpinctes guadeloupensis Ridgway becomes **Salpinctes obsoletus guadeloupensis** Ridgway, because shown to be only a subspecies of *Salpinctes obsoletus.* (*Cf.* Oberholser, THE AUK, XXXVI, No. 3, July, 1919, p. 407.)

Salpinctes guadeloupensis proximus Swarth becomes **Salpinctes obsoletus proximus** Swarth, because it proves to be a subspecies

of *Salpinctes obsoletus*. (*Cf.* Oberholser, THE AUK, XXXVI, No. 3, July, 1919, p. 408.)

Nannus hiemalis hiemalis (Vieillot) becomes **Nannus troglodytes hiemalis** (Vieillot), because found to be a subspecies of *Nannus troglodytes* (Linnaeus). (*Cf.* Oberholser, Proc. U. S. Nat. Mus., LV, April 28, 1919, p. 236.)

Nannus hiemalis pacificus (Baird) becomes **Nannus troglodytes pacificus** (Baird), because found to be a subspecies of *Nannus troglodytes* (Linnaeus). (*Cf.* Oberholser, Proc. U. S. Nat. Mus., LV, April 28, 1919, p. 235.)

Nannus hiemalis helleri (Osgood) becomes **Nannus troglodytes helleri** (Osgood), because found to be a subspecies of *Nannus troglodytes* (Linnaeus). (*Cf.* Oberholser, Proc. U. S. Nat. Mus., LV, April 28, 1919, p. 234.)

Nannus hiemalis semidiensis Brooks becomes **Nannus troglodytes semidiensis** Brooks, because found to be a subspecies of *Nannus troglodytes* (Linnaeus). (*Cf.* Oberholser, Proc. U. S. Nat. Mus., LV, April 28, 1919, p. 234.)

Nannus alascensis (Baird) becomes **Nannus troglodytes alascensis** (Baird), because found to be a subspecies of *Nannus troglodytes* Linnaeus. (*Cf.* Oberholser, Proc. U. S. Nat. Mus., LV, April 28, 1919, p. 229.)

Nannus meliger Oberholser becomes **Nannus troglodytes meligerus** (Oberholser), because found to be a subspecies of *Nannus troglodytes* (Linnaeus). (*Cf.* Oberholser, Proc. U. S. Nat. Mus., LV, April 28, 1919, p. 227.)

†**Nannus troglodytes kiskensis** Oberholser. New subspecies. Oberholser, Proc. U. S. Nat. Mus., LV, April 28, 1919, p. 228 (Kiska Harbor, Kiska Island, Aleutian Islands, Alaska). Range: Kiska Island and Little Kiska Island, Alaska.

†**Nannus troglodytes petrophilus** Oberholser. New subspecies. Oberholser, Proc. U. S. Nat. Mus., LV, April 28, 1919, p. 232 (Unalaska, Unalaska Island, Alaska). Range: Unalaska, Amaknak, and Akutan islands in the Aleutian Islands, Alaska.

†**Nannus troglodytes tanagensis** Oberholser. New subspecies. Oberholser, Proc. U. S. Nat. Mus., LV, April 28, 1919, p. 230 (Tanaga Bay, Tanaga Island, Aleutian Islands, Alaska). Range: Islands of Tanaga, Adak, and Atka, Aleutian Islands, Alaska.

Acanthopneuste borealis (Blasius) becomes **Acanthopneuste borealis kennicotti** (Baird). (*Phyllopneuste kennicotti* Baird, Trans. Chicago Acad. Sci., I, 1869, p. 313, pl. XXX, fig. 2; St. Michael, Alaska), because the North American bird proves to be subspecifically separable. (*Cf.* Oberholser, THE AUK, XXXVI, No. 3, July, 1919, p. 407.)

Hylocichla aliciae aliciae (Baird) becomes **Hylocichla minima aliciae** (Baird), because *Hylocichla minima* (Lafresnaye), which is *Hylocichla*

aliciae bicknelli Ridgway, is earlier. (*Cf.* Bangs and Penard, Bull. Mus. Comp. Zoöl., LXIII, No. 2, June, 1919, p. 30.)

Hylocichla aliciae bicknelli Ridgway becomes **Hylocichla minima minima** (Lafresnaye) (*Turdus minimus* Lafresnaye, Rev. Zool., XI, No. 1, Jan., 1848, p. 5 [Bogota, Colombia]), because the latter name has priority. (*Cf.* Bangs and Penard, Bull. Mus. Comp. Zoöl., LXIII, No. 2, June, 1919, p. 30.)

REJECTIONS AND ELIMINATIONS.[1]

***Coprotheres pomarinus camtschaticus** (Pallas) = **Coprotheres pomarinus** (Temminck). (*Cf.* Ridgway, Bull. U. S. Nat. Mus., No. 50, VIII, June 26, 1919, pp. 681–686.)

Larus hyperboreus barrovianus Ridgway vs. **Larus hyperboreus hyperboreus** Gunnerus. Proposed elimination as a subspecies (*cf.* Dwight, The Auk, XXXVI, No. 2, April, 1919, pp. 242–248) rejected. (*Cf.* Oberholser, Proc. Biol. Soc. Wash., XXXII, Sept. 30, 1919, pp. 173–175.)

***Onychoprion** Wagler = **Sterna** Linnaeus. (*Cf.* Ridgway, Bull. U. S. Nat. Mus., No. 50, VIII, June 26, 1919, pp. 459, 485.)

***Melanosterna** Blyth = **Sterna** Linnaeus, because not generically separable. (*Cf.* Ridgway, Bull. U. S. Nat. Mus., No. 50, VIII, June 26, 1919, p. 486.)

***Aestrelata diabolica** (Lafresnaye) = **Aestrelata hasitata** (Kuhl). (*Cf.* Bangs and Penard, Bull. Mus. Comp. Zoöl., LXIII, No. 2, June, 1919, pp. 21–23.)

Scaeophaethon Mathews vs. subgenus **Scaeophaethon.** (*Cf.* Wetmore, Bull. Mus. Comp. Zoöl., LXIII, No. 4, August, 1919, pp. 166–167.) Change to subgeneric rank rejected. (*Cf.* Oberholser, The Auk, XXXVI, No. 4, October, 1919, p. 557.)

Nettion carolinense (Gmelin) vs. **Nettion crecca carolinense** (Gmelin). Proposed reduction to a subspecies (*Cf.* Committee Brit. Ornith. Union, List Brit. Birds, ed. 2, 1915, p. 171) rejected. (*Cf.* Oberholser, The Auk, XXXVI, No. 1, January, 1919, p. 81–82.)

***Netta** Kaup considered not generically separable from **Nyroca** Fleming. (*Cf.* Millais, British Diving Ducks, I, 1913, p. 4.)

***Limnocinclus** Gould = **Pisobia** Billberg. (*Cf.* Ridgway, Bull. U. S. Nat. Mus., No. 50, VIII, June 26, 1919, p. 266.)

***Erolia ferruginea chinensis** (Gray) = **Erolia ferruginea** (Brünnich). (*Cf.* Ridgway, Bull. U. S. Nat. Mus., No. 50, VIII, June 26, 1919, pp. 250–255.)

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[1] Eliminations from the A. O. U. Check-List, the Sixteenth Supplement, the First, Second, Third, and Fourth Annual Lists are designated by an asterisk (*). Generic (and subgeneric) names so marked are merely discontinued in both generic and subgeneric sense, while the species included under them remain in the lists.

***Vetola** Mathews = **Limosa** Brisson. (*Cf.* Wetmore, Bull. Mus. Comp. Zoöl., LXIII, No. 4, August, 1919, pp. 180–182.)

***Leucopolius** Bonaparte = **Charadrius** Linnaeus. (*Cf.* Ridgway, Bull. U. S. Nat. Mus., No. 50, VIII, June 26, 1919, p. 114.)

***Arenaria interpres oahuensis** Bloxham = **Arenaria interpres interpres** (Linnaeus). (*Cf.* Ridgway, Bull. U. S. Nat. Mus., No. 50, VIII, June 26, 1919, pp. 46, 51.)

Astur Lacépède vs. **Accipiter** Brisson. Proposed elimination of **Astur** as a genus (*cf.* Hartert, Vögel paläarkt. Fauna, Heft IX [Band II, Heft 3], October, 1914, pp. 1145–1151) rejected. (*Cf.* Swann, Synop. List. Accip., I, July, 1919, p. 19.)

***Brewsteria** Maynard = **Archibuteo** Brehm, because not separable even as a subgenus. (*Cf.* Oberholser, The Auk, XXXVI, No. 3, July, 1919, pp. 420–421.)

***Bubo virginianus neochorus** Oberholser = **Bubo virginianus heterocnemis** (Oberholser). (*Cf.* Noble, Bull. Mus. Comp. Zoöl., LXII, No. 14, March, 1919, p. 551.)

Dryobates pubescens microleucus Oberholser vs. **Dryobates pubescens medianus** (Swainson). Proposed elimination (*Cf.* Noble, Bull. Mus. Comp. Zoöl., LXII, No. 14, March, 1919, p. 552) rejected. (*Cf.* Cory, Zoöl. Series, Field Mus. Nat. Hist., XIII (Pub. 203), Dec. 31, 1919, p. 490.)

Acanthis Bechstein vs. **Carduelis** Brisson. Proposed mergence (*Cf.* Hartert, Pract. Handbook Brit. Birds, pt. I, 1919, pp. 50, 59–61) rejected. (*Cf.* Hellmayr and Laubmann, Nomenclator Vögel Bayerns, 1916, p. 2.)

Spinus Koch vs. **Carduelis** Brisson. Proposed mergence (*cf.* Hartert, Pract. Handbook Brit. Birds, pt. I, 1919, pp. 50, 54) rejected. (*Cf.* Hellmayr and Laubmann, Nomenclator Vögel Bayerns, 1916, pp. 2–3.)

***Passerculus rostratus sanctorum** Ridgway = **Passerculus rostratus guttatus** Lawrence. (*Cf.* Oberholser, Ohio Journ. Sci., XIX, No. 6, April (May), 1919, pp. 349–351.)

***Toxostoma redivivum pasadenense** (Grinnell) = **Toxostoma redivivum redivivum** (Gambel). (*Cf.* Oberholser, The Auk, XXXV, No. 1, January, 1918, pp. 52–54.)

U. S. Biological Survey, Washington, D. C.

GENERAL NOTES

A Loon (*Gavia immer*) Caught on a Fishing Line.—November 17, 1918, Mr. Fred Lynn, of Branchport, caught a female Loon while trolling for bass in Lake Keuka. He had just felt his line ease up when the Loon broke water about a hundred feet behind and began to shake its head. At the same time he thought that he had a bite and began to pull in his line when he saw at once that he had "hooked" the Loon. It had swallowed the bait, a minnow, which was on a small Kinzie hook and in its struggles got tangled in the line and was landed with difficulty. As soon as it was landed in the boat it struggled and set up a great cry. It was impossible to dislodge the hook so Mr. Lynn cut the line as far down the Loon's neck as possible and gave the Loon to Mr. Albert Boyd who lived nearby. Mr. Boyd kept it just one day, then returned it to the lake. It dived at once and after coming up way out in the lake was last seen swimming rapidly away. Both Mr. Lynn and Mr. Boyd are well known to me and I vouch for the truth of the above.—Verdi Burtch, *Branchport, N. Y.*

Intestinal Cæca in the Anhinga.—Intestinal cæca in *Anhinga anhinga* seem subject in different individuals to variation in development, so that there has been some discrepancy and uncertainty in descriptions of them. In the following note is given a brief account of a few specimens that I have examined with some discussion of observations made by others.

In an immature male Anhinga, hatched in the National Zoological Gardens, that died when about six months old from the effects of an ill-advised meal of sand, I found two cæca, each about four mm. long. They were developed as small nodules partly embedded in the wall of the intestine, 125 mm. from the anus. While both cæca were well-formed, firm, and rounded, the one on the right side was slightly larger than the one on the left. From the inside these blind-guts appeared as shallow pockets in the intestinal wall with their inner, anterior margins somewhat thickened, more opaque in color than the surrounding tissue and perceptible as slight projections to the sense of touch. The right pocket was about one millimeter deep while the left one was slightly less.

The intestine (preserved in formalin) of another bird collected by Francis Harper in the Okefinokee Swamp had two cæca, one of which was represented merely by a slight, thickened ridge in the intestinal wall. A third specimen—an adult male that I killed in the mangrove swamps behind Cape Sable, Florida—when examined in the flesh had two cæca barely indicated as slight thickenings in the intestine that were almost imperceptible from the outside. The lower part of the intestine of this bird was placed in alcohol at the time but now shows no indication of the cæca even when examined minutely with the aid of a low power mag-

nification under a dissecting microscope. Another bird that I have seen had the cæca represented by small, slightly thickened ridges that would have been overlooked without careful search.

Several notes on the cæca of the American Anhinga have appeared in print previously. Garrod[1] remarks that there was one cæcum present, as in herons, in specimens that he dissected. In a second communication[2] he confirms his previous observation, stating that in this species he found no trace of a second cæcum. Forbes[3] notes that normally he found one cæcum but that in one individual there was in addition to a single cæcum of the ordinary size a much more rudimentary one developed on the other side of the intestine. While in another paper[4] he says that "it is not unusual . . . in a group of birds in which the cæca are of small size, and probably of no physiological importance, to find specimens or species with the normal number of cæca reduced by one. I may give as instances . . . *Plotus anhinga* amongst the Steganopodes." Beddard[5] records one cæcum in some specimens of the Anhinga while in others he notes that there were two. Mitchell[6] found only one vestigial cæcum in a bird that he examined.

From this it would appear that as Forbes has supposed the intestinal cæca in this species are not functional; and that they are on the road to disappearance. One cæcum often seems to be larger than the other, while the second may be vestigial. It is my belief, from my own observations, that some indication of this second one may be found if the gut is examined while fresh or after preservation in some fluid that causes rapid hardening. It would seem that at times this rudiment may be imperceptible in specimens dissected from alcohol or that it may be overlooked without minute search for it. It is possible that cæca are more prominent in young birds and that one or both of them may decrease in size with age.—Alexander Wetmore, *Biological Survey, Washington, D. C.*

On the Nesting of the Black Duck in Ohio.—In regard to the article in the last number of 'The Auk' on this subject by Mr. E. A. Doolittle, I would like to state that the species formerly nested quite frequently at the Grand Reservoir here in western Ohio, especially at two places, where the Big and Little Chickasaw creeks empty into the Reservoir. Mr. Doolittle quotes my article in 'The Auk', January, 1910, but evidently overlooked my record for the recent nesting of this duck in the spring of 1911, as recorded in 'The Wilson Bulletin,' December, 1912, page 198, which is a good and reliable record. Writers on Ohio birds

[1] Proc. Zool. Soc. London, 1876, p. 344.
[2] Proc. Zool. Soc. London, 1878, p. 681.
[3] Proc. Zool. Soc. London, 1882, p. 210.
[4] Voy. of Challenger, Zool., Vol. IV, Pt. XI, 1882, p. 22.
[5] Structure and Classification of Birds, 1898, p. 403.
[6] Trans. Linn. Soc. (London), Zool., Ser. 2, Vol. VIII, p. 192.

will do well to consult the pages of 'The Wilson Bulletin' before rushing into print.—W. F. Henninger, *New Bremen, Ohio.*

The American and European Widgeons in Massachusetts.—In 'The Auk' for April, 1911, in writing of ten years' observations on migrating ducks at Wenham Lake, Mass., I reported four occurrences of the European Widgeon (*Mareca penelope*) and suggested that this species is probably more common than is usually supposed.

Those records ended with the year 1909, and since then I have accurate notes for nine additional years at the same place, a series of nineteen years in all. In 1911 no shooting was done and no records kept.

During those nine years seven more specimens of *M. penelope* have been taken among only seven specimens of *M. americana*, as follows:

1910—*M. americana*, 1.
1912—*M. americana*, 3; *M. penelope*, 1, on October 24.
1913—No Widgeon taken.
1914—*M. americana*, 0; *M. penelope*, 2, on November 21.
1915—No Widgeon taken.
1916—*M. americana*, 3; *M. penelope*, 4, October 20 and November 2.
1917—No Widgeon taken.
1918—No Widgeon taken.
1919—No Widgeon taken.
Total for the nine years—*M. americana*, 7; *M. penelope*, 7.
Total for 19 years—*M. americana*, 59; *M. penelope*, 11.

All specimens of the European species were in female plumage and showed both the typical rusty coloring of the head and the dark gray axillaries. It is very likely that some specimens of *M. penelope* were classed as *M. americana* in the early years of shooting at Wenham, before the diagnostic value of the axillars was learned.

On November 14, 1919, I noted one specimen of *M. penelope* hanging up in a duck blind on the south shore of Great Bay in the town of Greenland, N. H., not far north of the Massachusetts state line. This bird was also in female or in immature plumage. I was told that a small flock of twenty or thirty Widgeon had been feeding in Great Bay for several days, but this was the only one that had been shot. At Squibnocket Pond, Chilmark, Mass., which is situated at the southwest corner of Martha's Vineyard Island, out of 120 Widgeon taken between October 22 and December 10, 1919, one fine male of *M. penelope* was shot November 6. I examined all these Widgeon very carefully myself.

On December 8, 1919, I watched another full plumaged male *M. penelope* through a glass at close range, among a raft of many hundred Widgeon and Red-heads at Squibnocket.

It certainly seems that among the rare straggling Widgeon which appear irregularly east of Boston, at Wenham, *M. penelope* is at least relatively more abundant than among the Martha's Vineyard birds. Can it be

that *M. penelope* comes mostly down the coast from the northeast, perhaps from Greenland, while our *M. americana* arrives from the West? This would explain the apparent increase of the European bird by continuous increments from some far northeastern breeding ground.

It is also remarkable that we have never noted a full plumaged male Widgeon, either *americana* or *penelope*, at Wenham Lake, whereas at the "Vineyard" full plumaged males are much in evidence as early as mid-October. Probably those individuals occurring east of Boston, at Wenham, are young birds of the year which are much more likely to straggle beyond their regular migration route; the normal range of *americana* reaching only to Martha's Vineyard.

It may be worth while to note here that the American Widgeon, which is generally considered an irregular and scarce migrant all over Massachusetts, is really a very common duck on the south shore of Martha's Vineyard Island, frequenting Squibnocket and Black Point ponds as well as Poucha Pond on Chappaquiddick Isle.

The first *M. americana* arrived this year (1919) at Squibnocket on August 31 (six or eight birds). By September 15 there were thirty in the pond and on the 21st about seventy-five. During October the numbers increased to 1500 or 1800 and at times in November to possibly 2000. They never spend the night in Squibnocket but fly to other and better feeding grounds at dark. This body of Widgeon usually remains, so I am told, until driven out by ice.—J. C. Phillips, *Wenham, Mass.*

Whistling Swan (*Olor columbianus*) in Massachusetts.—On November 6, 1919, I saw a flock of seven swans at Squibnocket Pond on Martha's Vineyard Isle, in the town of Chilmark, Mass. They were still in the pond on the following day and residents told me they had already been there several days when I first saw them. They left on November 10 or 11.

This is the largest flock of Whistling Swans that I recall for Massachusetts, most of the records having been for single birds. Mr. John E. Thayer received two swans from this same pond in 1906, shot on November 28 and 29. Three swans were observed at Squibnocket within the past few years, but I have not the exact date. This pond has a good supply of Widgeon grass and musk grasses, with some wild celery, and could probably furnish good feeding ground for swans.

So far as I know these seven swans were not persecuted and left for the south in as good condition as when they arrived. The recent marked increase of the Whistling Swan in Currituck Sound, N. C., where it is said to be doing considerable damage to ducking property, may account for its more frequent occurrence in Massachusetts.—J. C. Phillips, *Wenham, Mass.*

Habits of the Two Black Ducks, *Anas rubripes rubripes* and *Anas rubripes tristis*.—This past autumn of 1919, while shooting at

Squibnocket Pond, Chilmark, Mass., a very interesting fact was brought to light, namely, that no Red-legged Black Ducks resort to this region, and this experience was so different from that to which we are accustomed in any of the eastern Massachusetts ponds, where Black Ducks are shot through the entire season, that it seemed worth while to record it. It is of especial interest because it brings out the different habits of the two forms.

The south shore of Martha's Vineyard Isle consists in the main of a chain of fresh, brackish, and salt ponds, separated from the sea by a beach. There are no salt marshes proper, and no tidal flats off the shore. In many of these ponds there is excellent feeding ground for diving ducks, but not much shallow ground for surface feeders. Nevertheless a goodly number of Black Ducks resort to Squibnockett, using it as a day-time refuge, and flighting to small sloughs scattered through the pastures and uplands at night. Squibnocket is entirely fresh. The ducks have been systematically baited there for many years and a number of pairs breed. On August 20 last there were some 250 to 300 Black Ducks and on September 15 this number had not increased greatly. On September 20 some 600 were counted and by early October they had about doubled. After the 10th of October it did not appear that there was any increase; and the same number persisted until driven away by the big freeze of December 12, 13, and 14, 1919.

Black Ducks were shot on the following dates: September 23, 24; October 14, 22; November 6, 7, 14, 21, 25; December 1, 4, 7, 8, 9, 10. In all, 224 were taken during the season, and all of these, except 28, I examined personally. There was no marked change in the appearance of these ducks as the season advanced. In some of the mlaes the color of the legs increased slightly in richness, but never approached the coral red of *rubripes*. No other *rubripes* characters were noted. The average weight of the males in mid-October was 2.86 pounds and the females averaged 2.43 pounds. By December 10 these weights had increased to 3.24 in the males and 2.66 in the females, a very high average, induced no doubt by artificial feeding.

This body of birds became almost sedentary in its habits as the season advanced, and when not disturbed they spent almost the entire day asleep on the beaches at the west end of the pond. Even when greatly disturbed they seemed loth to go to sea, although it meant a flight of only a couple of hundred yards. They seldom remained long in the ocean. At night many of these ducks resorted to small bog holes scattered through the pastures, up to the time when ice made this impossible.

It is fair to presume that nearly all these ducks would have passed south early in the season if they had not been attracted and held by grain. The absence of the tidal flats and marshes of course explains the non-appearance of *rubripes*, but that there should be such a sharp line of demarkation between the two forms at any one place seemed hardly possible.

The habits that characterize the two forms as they appear in autumn in New England may be thus summed up: *Anas rubripes tristis:* Breeding locally and often migrating as early as, or before, mid-September, or at least "shifting ground" from inland nesting grounds to better feeding grounds near coast. Feeding in both ponds and salt meadows, but if in salt meadows resorting to fresh water once or twice a day. Much less nocturnal in feeding habits than *rubripes*, because less shy, and much less inclined to spend day on open ocean. Prefers good fresh water and brackish water food, but spends the winters on the coast of New England in small numbers, along with *rubripes*. Reaches great size at times. Largest male 3 pounds 10 ounces; largest female 2 pounds 15 ounces (Squibnocket, 1919). More difference in size between sexes than in *rubripes!* Comes readily to live decoys, no matter how extreme the voice may be (too high or too low); and is more loquacious than the red-legged form.

A. rubripes rubripes: Late migrant, never becomes localized except near sea, and where marine food in the form of small mollusca is abundant. Very seldom resorts to small ponds or bogs, but likes large open sheets of fresh water near ocean, to which it often makes daily trips to drink and rest, but not to feed. Is better able to sit off-shore in rough seas; and in general appears a more rugged bird with heavier feathering and superior resistance to extreme cold. In winter, it does not depend on ponds for fresh water, but obtains a sufficient supply in small springs about salt meadows at low tide.

This is a much more wary bird, is more silent itself, and comes less easily to live decoys, towards which it manifests an instinctive fear, especially if they be loud or shrill callers. In the salt meadows the best gunners prefer sea-weed bunches or canvas sacs, and find the live decoys useless, especially late in the season.

When a flock of *rubripes* alights on a pond near a shooting stand, they nearly always keep at a safe distance until perfectly satisfied of their surroundings. Then, more often than not, they will swim away from the stand and its live decoys. If they approach the stand, which they do with the utmost caution, and with necks erect, they are not apt to keep closely together as *tristis* does.

Extreme weights not much above that of *tristis*. Heaviest male noted by myself, 3 pounds 12 ounces. Average is a good deal heavier than *tristis*, females perhaps more nearly size of males than in *tristis*, but no figures at hand to bear out this point.—J. C. PHILLIPS, *Wenham, Mass.*

Flight of Water-fowl at Washington, D. C.—On February 24, 1920, an unusual flight of water-fowl, bound in a southerly direction and flying at an altitude of probably one thousand feet, passed over Washington. During the following three days we experienced the coldest weather of the winter, the thermometer hovering about the 13 degree mark.

On February 7, with the temperature at 15 above zero, a flock of five Canada Geese passed over the city and alighted in East Potomac Park. The wind on that day at times attained a velocity of forty-five miles an hour.—BRENT M. MORGAN, *224 Eleventh St., S. W., Washington, D. C.*

Nesting of the Greater Yellow-Legs in Newfoundland.—On June 20, 1919, Mr. J. R. Whitaker and the writer had the satisfaction of discovering a female of this species (*Totanus melanoleucus*) brooding four young just out of the shell and still in the nest, in a large bog in the vicinity of Grand Lake, N. F. Led to the spot by the ever increasing cries of the male bird, the nest, which was nothing more than a bare depression ten inches in diameter and three inches deep, upon the top of a mound of peat otherwise covered over with a short growth of sheep laurel, was noticed three yards from where we had stopped in doubt as to where next to proceed.

It presented an unusual domestic picture; one youngster was perched on the mother's back, while one or two others appeared from under her wings after the manner of domestic fowls. The parent remained until we closed in, when she flew low from the nest with a piercing cry, and after circling about overhead took up a position on a dead stub nearby, from which she continued to *kip, kip, kip, kip*—incessantly as long as we remained near the nest, the male likewise calling and circling above.

The young, whose legs were not as yet strong enough to bear their weight, lay flat in the nest. They were mottled in gray, brown and black down, white below. Some of the lighter spaces on the back tending toward buffy. The eyes were large and black, bill one-half an inch long, lead-black in color, while the legs were characteristically long and greenish in color. Notwithstanding the recent hatching of the eggs, only one or two small pieces were to be found, the empty shells doubtless having been carried away by the parents.

On visiting the nest the day following, the young could not be found, although the actions of the old birds indicated their presence in the vicinity.—GEORGE H. STUART, 3rd, *Girard Trust Co., Philadelphia.*

Nesting of the Little Black Rail in Atlantic County, N. J.—On July 4, 1919, Mr. Julian K. Potter and the writer flushed a small rail in a marsh an acre or two in extent, beyond the sand dunes immediately back of the ocean beach, on an island below Beach Haven, N. J. Searching for the nest in the belief that the bird was a Little Black Rail, we were rewarded by finding it placed among the long grasses, the tops of which were so drawn over as to almost completely hide the eggs from view. The nest, which was composed entirely of the same rather fine grass, was placed about one inch above the damp ground and contained eight eggs, very heavily incubated.

On returning several times at intervals of ten minutes we had opportunities of observing the female on the nest, her bright red eyes being the most prominent feature. On each occasion when leaving the eggs, she darted from the nest into the surrounding grass, never taking wing, and with such celerity that it was impossible to observe her movements, the action resembling more that of a mouse than a bird.

Eventually she was seen and caught in the hand while moving through some shorter grass. Mr. J. Fletcher Street secured some excellent photographs of the bird while thus held. On being released, the bird again disappeared into the grass by a similar dart as before, never at any time showing the slightest indication of wing power. The first bird, flushed some ten yards from the site of the nest, was doubtless the male, forced to fly because of insufficient cover when surprised.—GEORGE H. STUART, 3rd, *Girard Trust Co., Philadelphia.*

Maggots in the Ears of Nestling Cooper's Hawks (*Accipter cooperi*).—On July 8, 1913, when examining three Cooper's Hawks seventeen days old, I found maggots in their ears and took a maggot from each ear of the three birds. In one ear of one of the birds there was another maggot which I could not get as it went far back into the ear. Possibly these maggots were the larvae of the Screw-worm Fly (*Campsomyia macellaria*). I visited these birds again July 20, when their ears appeared to be quite normal.—VERDI BURTCH, *Branchport, N. Y.*

Age Attained by the Hyacinth Macaw.—A venerable specimen of the Hyacinth Macaw (*Anodorhynchus hyacinthus*) well known to the visitors to the Philadelphia Zoological Gardens, died on February 28, 1920. The records of the Zoological Society show that the bird was received on July 22, 1893, so that it had been on exhibition in the bird house for over twenty-six years. How long the bird had lived before it was captured it is of course impossible to say. At the time of its death it was still in perfect plumage.—WITMER STONE, *Academy of Natural Sciences, Philadelphia, Pa.*

Curious Habits of the Whip-poor-will.—Mr. Moritz Boehm, a neighbor of mine, has a very beautiful place surrounded on two sides by a deep ravine. Each year for the past six or seven seasons a pair of Whip-poor-wills have spent the summer on his grounds, and have become quite tame. The male has certain stands around the house, and comes up from the depths of the ravine at night and calls, first from one perch, then another, until he has gone around the house several times, usually answered by Mr. Boehm. On different occasions, while the male was calling, he saw the female going through some peculiar antics, but in the dusk could not make out just what she was doing. One evening, when he was sitting

on the lower step, the birds came up and performed within ten feet of him. He kept perfectly quiet. The male called from a low branch overhead, while the female strutted on the gravel path below, with wings and tail outspread and head lowered, and sidestepped back and forth, half way around to the right, then to the left, all the time uttering a curious gutteral chuckle. This performance was kept up for ten or fifteen minutes.

One morning he saw them sleeping on a log. They were sitting close together facing each other, their heads about half way along side of one another, while each had one wing spread over the other's head. This male bird had a peculiar call which could be recognized from the other Whip-poor-wills which were heard in the woods nearby, and Mr. Boehm, who is a close observer of nature, is quite sure that the same pair come to visit him every summer.—HENRY K. COALE, *Highland Park, Ill.*

***Aeronautes melanoleucus* (Baird) versus *Aeronautes saxatalis* (Woodhouse).**—The White-throated Swift of western North America is commonly called *Aeronautes melanoleucus* (Baird) (*Cypselus melanoleucus* Baird, Proc. Acad. Nat. Sci. Phila., VII, June, 1854, p. 118; "Camp 123, west of San Francisco Mountains" [on Bill Williams River, west of Ives Peak, Lat. 34° 15′ N., Arizona]). As is well known, there is an earlier name in *Acanthylis saxatalis* [sic] Woodhouse, in Sitgreaves' 'Report of an Expedition down the Zuni and Colorado Rivers,' 1853, p. 64, based on a bird seen at "Inscription Rock, New Mexico." This name has been rejected chiefly because no specimen was obtained and because the description given was not entirely accurate. This description is as follows:

"Head and rump white; back, tail, wings, and sides black, beneath white; upper tail coverts black; under coverts white; about the size of *A. pelasgia*, and in its mode of flight the same."

The chief discrepancies in this account are the statements that the head and rump are white, and that the under tail-coverts are white. Any one who has seen this species in life, however, will readily recall that when the bird is flying the white flank patches spread out both above and below, so that the rump and even the under tail-coverts also, have all the appearance of being white, which circumstance readily explains these two discrepancies in Woodhouse's description of a bird seen in flight. The head is in some individuals very light colored, and in certain lights might readily at a distance appear superficially white. There can be no doubt at all that the White-throated Swift was the bird seen at Inscription Rock by Dr. Woodhouse and described as above; and this most writers on the subject readily admit. Furthermore, there is no rule of nomenclature that provides for the rejection of a name based on the printed description of an animal only seen in life, nor for the rejection of a name if certainly identifiable even though the description be partly inaccurate. We see, therefore, no reason for not hereafter calling our White-throated Swift

Aeronautes saxatalis (Woodhouse).—Harry C. Oberholser, *Washington, D. C.*

A New Name for *Phaeochroa* Gould.—The name of the genus of Trochilidae now known as *Phaeochroa* Gould (Introd. Troch., 1861, p. 54; type, *Trochilus cuvierii* De Lattre and Bourcier) proves to be preoccupied by *Phaeochrous* Laporte de Castelnau (Hist. Nat. Ins., II, 1840, p. 108), a genus of Coleoptera. As it seems to be generically separable from *Aphantochroa* Gould and appears to possess no synonym, we propose to call it *Bombornis* (βόμβος bombus; ὄρνις avis) nom. nov., with *Trochilus cuvierii* De Lattre and Bourcier as type. The following species are referable to this genus:

Bombornis cuvierii cuvierii (De Lattre and Bourcier).
Bombornis cuvierii saturatior (Hartert).
Bombornis roberti (Salvin).—Harry C. Oberholser, *Washington, D. C.*

Great Crested Flycatcher in Massachusetts in Winter.—On December 8, 1919, at Nahant Beach, Mass., I found a Great Crested Flycatcher (*Myiarchus crinitus*). The bird was in apparently good condition and quite tame. When alarmed at my close approach it seemed reluctant to leave the immediate vicinity and allowed me to observe it at close range. On the beach, where I first flushed it, was a mass of kelp, washed up by the tide, and covered with hundreds of black insects the size of a common fly. When I walked by, the insects rose in clouds covering my clothes. Upon these insects the bird was feeding, catching them from its perch on the rocks or from a wooden fence that runs along a walk near the beach. It would be interesting to know whether or not it will survive the winter.—Charles B. Floyd, *Auburndale, Mass.*

The Song of the Boat-tailed Grackle.—During a six weeks' trip through central and eastern Florida in January and February, 1917, the writer had numerous opportunities to improve acquaintance with this distinctive grackle (*Megaquiscalus major major*). Here its range is not strictly maritime (as it appears to be elsewhere along the Atlantic Coast from Georgia to Maryland), for it makes its home also about the many bodies of fresh water throughout the interior of the state as far north as the vicinity of Gainesville. It is known everywhere to Florida people as the 'Jackdaw,' a name probably adopted and handed down by the early settlers because they saw in this species some slight similarity to the Old-World Jackdaw (*Colœus monedula*), a small representative of the family Corvidae. The females differ so much in size and color from the resplendent males that they have gained, here and there, a separate appellation; in the Kissimmee region, for instance, they are said to be called 'Cowbirds.'

In view of the lack of any intensive study of the Boattail's life history, it is perhaps not surprising that a certain deceptive feature of its song has failed to be generally understood.

The species was in full voice as early in the season as January 20, at Mayport. Here some males were perching in a live-oak and uttering their not unpleasing notes, which suggested somewhat a European Starling's medley. On Merritt's Island, where I found small numbers of these birds on February 19, I began to pay close attention to the male's musical performance, and more particularly to that part of it which Chapman describes as "a singular rolling call, which bears a close resemblance to the sound produced by a Coot in pattering over the water."[1] A male, which was sitting on a stake in the marsh and indulging persistently in its curious song, furnished a convenient subject for observation. The song seems to vary in length with individuals, but one performance that I heard to particular advantage (this was at Sebastian, a few days later) might be rendered as follows: *kip, kip, kip, kip-kip-kip-kip-kip-kip-kip, chrrr, chrrr, chrrr, chrrr, chrrr, chrrr, pt-pt-pt-pt-pt-pt-pt-pt.* The first part consists of a succession of simple, short *kips*, the first few given more slowly than the rest; the second part, of rolling, guttural *chirr*ings; and the third part, of the sound described by Chapman. I noticed that when the bird reached the final part of its song, it vibrated or slightly fluttered its wings, so that their tips appeared to strike either together or against the upper side of the tail. At the same time the bill had the appearance of partly closing. I therefore concluded that the sound was not vocal, but wing-made; and a number of subsequent observations strongly confirmed me in this opinion.

It was not until my last morning in Florida (at Fernandina, February 27) that I was undeceived. I then had an excellent view of a bird that was walking over the muddy shore, and saw that its wing-tips did not touch during the final part of the song, though they vibrated a little. A little later another bird, perched on a telephone pole, did not appear to vibrate its wings at all during the song. I could plainly see the bill in a sort of rattling motion, however, and finally realized that it was the rapid striking together of the mandibles that produced the sound suggestive of that which a Coot makes in pattering over the water.

On my return from the field I was interested to find that the few published accounts of this feature of the song disagree as to the manner in which it is produced. Mr. Arthur T. Wayne writes that "the males . . . perch upon a limb of some tree and with their wings make a loud rolling sound. This peculiar noise is also made while the birds are flying."[2] Bradford Torrey, in his delightful 'Florida Sketch-book,' has given so apt an account of the Boattail and its music that it seems worth

[1] Handbook of Birds of Eastern North America, 1912, p. 368.
[2] Birds of South Carolina, 1910, pp. 112–113.

while to quote at length from this gifted observer and interpreter of bird ways:

"He opened his bill—*set* it, as it were, wide apart—and holding it thus, emitted four or five rather long and very loud grating, shrikish notes; then instantly shook his wings with an extraordinary flapping noise, and followed that with several highly curious and startling cries, the concluding one of which sometimes suggested the cackle of a robin. All this he repeated again and again with the utmost fervor. . . . The introduction of wing-made sounds in the middle of a vocal performance was of itself a stroke of something like genius. . . .

"That the sounds *were* wing-made I had no thought of questioning. . . . Two days afterward, nevertheless, I began to doubt. I heard a grackle 'sing' in the manner just described, wing-beats and all, while flying from one tree to another; and later still . . . I more than once saw them produce the sounds in question without any perceptible movement of the wings, and furthermore, their mandibles could be seen moving in time with the beats. . . .

"If the sounds are not produced by the wings, the question returns, of course, why the wings are shaken at just the right instant. . . . The reader may believe, if he will, that the bird is aware of the imitative quality of the notes, and amuses itself by heightening the delusion of the looker-on. My own more commonplace conjecture is that the sounds are produced by snappings and gratings of the big mandibles . . . and that the wing movements may be nothing but involuntary accompaniments of this almost convulsive action of the beak. But perhaps the sounds *are* wing-made, after all."[1]

The first, second, and third parts of the song, as described by Torrey, correspond, respectively, to what I have considered the second, third, and first parts. In view, however, of the continuous nature of the Boattail's performance, almost any part of the song might be taken as the first.

Mr. Alexander Wetmore tells me that his observations on the species at Punta Gorda in early February, 1919, fully support the conclusion that the pattering sound is produced mechanically by the mandibles.—Francis Harper, *Biological Survey, Washington, D. C.*

Clark's Crow in Denver.—The undersigned saw, to his amazement, a pair of Clark's Crows (*Nucifraga columbiana*) flying over the city well within the residential district on December 7, 1919; the region of Denver had had, previous to this date, two spells of zero weather, and whether the extreme cold caused these unusual visitors to our city it is hard to determine. This is the first occasion that I have seen this crow so far away from the mountains of our neighborhood, and the first time in Denver.—W. H. Bergtold, *1121 Race St., Denver, Colo.*

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[1] A Florida Sketch-book, 1894, pp. 108–110.

Another Occurrence of a Starling Near Montgomery, Ala.—On Sunday, January 4, 1920, two gentlemen from Montgomery, while hunting at the mouth of the Coosa and Tallapoosa Rivers, and near old Fort Toulouse, noted a large flock of what they thought to be Waxwings. As they looked rather large, however, they fired one shot to settle the question, killing two birds, which proved to be Starlings (*Sturnus vulgaris*). They estimated the number to have been conservatively from 150 to 200, and noted two other small flocks of from eight to twelve birds later on during the day. They think, however, that these two last named groups were from the original flock which had alighted in a tree, and which they later in the day saw feeding in the neighborhood.

I was presented with one of the birds, which proved to be a male. The other one killed had been picked before I learned of its having been killed. The male has been mounted, and presented to the Museum of the State Geological Survey at Tuscaloosa.

This is the second occurrence in the past two years of the Starling near this city, the other one having been reported by me in 'The Auk' for April, 1918. It was killed on the night of January 14, 1918.—Peter A. Brannon, *Montgomery, Ala.*

A Flight of Newfoundland Crossbills.—Apparently the cone crop in Newfoundland has been a failure this season and, on account of the scarcity of food, the resident Crossbills have been induced to wander far in search of food. I have had five specimens of *Loxia curvirostra percna* sent to me in the flesh from Chathamport, Mass.; Mr. Harry T. Hathaway has sent me three from Rhode Island; and Mr. Alexander Wetmore has sent me one from Virginia. These specimens, which are all typical *percna*, indicate an extensive flight of this subspecies. It would be interesting if other observers elsewhere would be on the lookout for this subspecies and report them, so that we can determine the limits of this rather unusual flight and learn how universal it is and how abundant the birds are.

Loxia curvirostra percna is easily distinguishable, even in life, from *Loxia curvirostra minor*, with which it seems to be associated in this flight, by its decidedly larger size and by its much longer and heavier bill. I should be glad to identify any specimens that may be sent to me for determination.—A. C. Bent, *Taunton, Mass.*

Evening Grosbeak at Valley Falls, N. Y.—On January 20, 1920, a flock of Evening Grosbeaks appeared in town. They were first seen near the public school and later I counted twelve feeding on the seeds of a sugar maple in my front yard. They uttered a single sweet note from time to time and seemed little disturbed by persons passing by. A few days later a single female was seen in the same tree. I saw her break off a twig at least an inch long and apparently devour it whole.—Grace Young Bowen, *Valley Falls, N. Y.*

Evening Grosbeak at Brantingham, Lewis Co., N. Y.—Early on the morning of May 20, 1916, Mr. C. F. Stone and myself saw a female Evening Grosbeak in the woods near the hotel at Lake Brantingham. When first seen it was on the ground where it soon picked up a small twig in its bill, flew with it up into a beech tree, and we had hopes of finding the nest. However the twig did not seem to suit, as it was soon dropped to the ground and the Grosbeak flew off through the woods and we could not again locate it.—VERDI BURTCH, *Branchport, N. Y.*

The Evening Grosbeak in Monte Vista, Colo.—In order to add to the fullness of the records concerning the great wave of Evening Grosbeaks (*C. vespertina*) which seemed to have been widespread over a large part of the United States this winter, the following notes are here recorded: The Western Evening Grosbeak (*C. v. montana*) was first seen in Monte Vista, this year, on October 17, there being three females. They were eating buds from the willow trees in my yard. On October 21, a flock of more than twenty-five males and females was noted in the yard. Many more were seen thereafter, from October 24 to October 28, inclusive. They left the vicinity of my house on October 28, just before a severe snowstorm, which occurred the next day. These birds seemed to prefer the buds of willow trees, and it also seemed to me that at first the males and females kept apart, though the sexes mingled later on; the females arrived first. Because of their extraordinary tameness they could be studied at close range and to great advantage, hence the realtive ease in determining the sexes.—MRS. JESSE STEPHENSON, *Monte Vista, Colo.*

Some Sparrow Notes from Madison, Wisconsin.—On May 17, 1919, I collected a typical specimen of Gambel's Sparrow (*Zonotrichia l. gambelii*) in the vicinity of Madison. My identification was later affirmed by Dr. Oberholser. The bird was unaccompanied by any other sparrow. A point of passing interest may lie in the fact that I obtained this spring only one record, May 4, of the White-crowned Sparrow (*Z. leucophrys*) during the course of forty extensive field trips. The status of *Z. l. gambelii* in the middle-western states, east of the Mississippi, follows: There are no records for Ohio through 1919 (Lynds Jones), for Indiana through 1897 (Butler), for Michigan through 1912 (Barrows), or for Illinois through 1909 (Cory). For Wisconsin a typical specimen dated April 20, 1871, was taken by Dr. Hoy, and a further entry in the Kumlien-Hollister State List adds, "Specimens have been taken a number of times about Lake Koshkonong which are almost, if not quite, typical *gambelii*."

The writer has two spring observations to record of Le Conte's Sparrow (*Ammodramus leconteii*), both singing males from the vicinity of Madison. The birds in each case were relatively easy of approach, in moist prairie fields, and were studied under ideal conditions. The first sparrow was observed while the writer was in company with Norman DeW. Betts on

April 16, 1916; the second by the writer alone on May 10, 1919. There are apparently no other spring records for Wisconsin, only one record—time of year not stated—for Michigan, while most of those from Illinois seem to be in the fall. The writer took two specimens of the Clay-colored Sparrow (*Spizella pallida*) in a dry, shrub-covered field, remote from the city, on May 8, 1919. In the same field on May 30, a nest with three eggs was found on the ground at the foot of a bush. In May of 1918, in the same area, I recorded twenty males on May 4. This sparrow is not rare in southern Wisconsin but is eccentrically local.—WARNER TAYLOR, *Madison, Wisconsin.*

***Zonotrichia albicollis* Again in Colorado.**—Since writing 'The Birds of the Clear Creek District,' published in the last issue, the writer has had the good fortune to secure a specimen of the White-throated Sparrow, which is not only a new species for this region, but is also the fourth record for Colorado.

The specimen, C. M. N. H. No. 7490, is an adult male, and was taken in the Clear Creek Valley, Colorado, Nov. 2, 1919. It is preserved in the collections of the Colorado Museum of Natural History.—F. C. LINCOLN, *Denver, Colorado.*

The Proper Name of the West African Serin.—The bird figured and described from Cuba by d'Orbigny as *Linaria caniceps* was without any reason whatever referred by Gundlach (Jour. f. Orn., 1871, p. 276) to the Nonpareil, *Passerina ciris* (Linné), which it does not resemble in any way. Later Ridgway (Birds of North and Middle America, Part I, 1901, p. 589) includes the name, with a query, in the synonymy of *P. ciris.*

As d'Orbigny's work on Cuban birds was based in part on specimens from Cuba in the Lafresnaye collection—Lafresnaye's written labels for his specimens bearing testimony to this in more instances than one—we have had, in the course of our work on the Lafresnaye collection, to study critically all species described as new by d'Orbigny. It was at once evident to us, as soon as we saw Plate 16 of the Atlas, that it represented an African *Serinus* and not the Nonpareil. We therefore searched among the specimens of this genus in the Lafresnaye collection for one that might possibly have been the subject of this plate and found number 6785 with a label in Lafresnaye's handwriting, which reads as follows: "Crithagra chrysopyga Sw. W. af. 1. 206 pl. 17. junior? Cuba. an e Senegarabia allatus?" The specimen agrees minutely with the original description and with the plate, except that the gray of the head has faded from long exposure to direct sunlight, as a mounted bird, to a dull, dirty grayish. It is thus in all probability the type of the species.

We identify both bird and plate positively as the species which Reichenow (Vög. Afr. III, (1), 1904, p. 272) calls *Serinus hartlaubi* (Bolle).

The example was of course brought from West Africa, probably from Senegal, to Cuba, and very likely it was an escape from captivity actually taken there.

D'Orbigny's name for the Gray-headed Serinus being older than any of the other names applicable to the species, must be used instead of *S. hartlaubii*, and the species will have to stand as—

SERINUS CANICEPS (d'Orbigny).

Linaria caniceps d'Orbigny in: La Sagra, Hist. Nat. Cuba, 1840 (=1839) p. 107, Atlas pl. 16 (Cuba, escaped cage-bird—we substitute Senegal, West Africa). Type (?), M. C. Z. 83869, Lafr. coll. 6785.—OUTRAM BANGS and THOMAS E. PENARD, *Mus. Comp. Zool., Cambridge, Mass.*

The Louisiana Tanager in Massachusetts.—On December 19, 1919, Miss M. J. Sitgreaves found an adult female Louisiana Tanager (*Piranga ludoviciana*) in a dying condition in a garden in Brookline, Mass. It was taken into the house and warmed and fed by the ladies, but soon died. The weather was extremely cold at the time.

The bird was given to Prof. Roland Thaxter who brought it to the Museum of Comparative Zoology, where it was skinned and found to be fat and apparently in perfect health.

I believe this is the second record for Massachusetts, and the fourth for New England. The others are: Maine, near Bangor, about October 1, 1889; Massachusetts, Salem, January 20, 1878 (taken alive); Connecticut, New Haven, December 15, 1892. Thus three of the four New England records are of birds taken in winter.

The specimen has been transferred to the Boston Society of Natural History, where New England record specimens, so far as possible, are gathered together.—OUTRAM BANGS, *Mus. Comp. Zool., Cambridge, Mass.*

Bohemian Waxing in Illinois.—Northeastern Illinois is having a visitation of Bohemian Waxwings (*Bombycilla garrulus*) this winter. They were first noticed in Jackson Park, Chicago, by Nathan Leopold, who wrote of seeing several hundred of them on Thanksgiving day, feeding on the red berries of certain trees in the Park. The following Sunday Colin Sanborn and H. L. Stoddard went up to the pine woods along the Lake Michigan shore at Beach, about twelve miles north of here, and succeeded in taking a number of specimens. It was a very cold day with a high north wind, and flock after flock passed over, heading south. They were wild and hard to reach with fine shot. Mr. Stoddard estimated that about fifteen hundred passed over while they were in the pines. Those taken had the throats and stomachs stuffed with Juniper berries. During December numerous small flocks were seen about the town. They

would appear in a mountain ash tree or hedge of barberry or high bush cranberries, and stay several days, until every berry was eaten. Mr. Charles Douglas, of Waukegan, also reports several flocks there, and many were seen later in December by Mr. Stoddard among the sanddunes near Gary, N. W. Indiana. This is a rare bird here, and it is the first time I have ever seen it alive.—HENRY K. COALE, *Highland Park, Ill.*

The Yellow-Throated Warbler in Central New York.—A Correction.—Mr. J. T. Nichols has kindly called my attention to an omission in my note (Oct., 1919, pp. 580, 581, The Auk, XXXVI) on this species. The date of the record is missing. It should be May 23, 1919, and the phrase "he replied" should appear "I replied."—A. H. WRIGHT, *Cornell University, Ithaca, N. Y.*

The Louisiana Water-Thrush Breeding at Graniteville, Aiken County, South Carolina.—I am indebted to Misses Marion Jay Pellew and Louise Petigru Ford for the privilege of announcing the breeding of the above species at Graniteville, S. C. These ladies observed three young birds being fed by their parents during the early part of May, 1919. About ten years ago Mr. B. F. Taylor, of Columbia, S. C., found a nest containing eggs and the bird setting near Columbia. This breeding of the Louisiana Water-Thrush in the Lower Austral life zone is certainly surprising because Mr. Leverett Mills Loomis during all the years he spent at Chester, S. C., studying birds found this species a very rare migrant, and did not detect it breeding. In 'The Auk' (Vol. VIII, 1891, p. 172) Mr. Loomis has the following: "This species has been taken only upon three occasions, viz., Aug. 10, 1887; July 25 and 31, 1888." Chester is certainly in, or very near, the Upper Austral life zone.—ARTHUR T. WAYNE, *Mt. Pleasant, S. C.*

***Elminia* Bonaparte Preoccupied.**—The genus of Muscicapidae hitherto known as *Elminia* Bonaparte (Compt. Rend. Sci. Nat., XXXVIII, 1854, pp. 388, 652; type, *Myiagra longicauda* Swainson) is apparently in need of a new name. It is invalidated by *Elminius* King (Zool. Journ., V, 1831, p. 334) for a genus of Crustacea. As it appears to have no other name, it may stand as *Erannornis* (ἐραννὸς, delicatus; ὄρνις, avis) nom. nov., with *Myiagra longicauda* Swainson as type. The species referable to this generic group are as follows:

Erannornis longicauda (Swainson).

Erannornis teresita (Antinori).

Erannornis schwebischi (Ouslalet).

Erannornis albicauda (Bocage).—HARRY C. OBERHOLSER, *Washington, D. C.*

***Toxostoma crissalis* versus *Toxostoma dorsalis*.**—The current technical name of the Crissal Thrasher is *Toxostoma crissalis*, but this apparently must be changed. The species was originally described under the name *Toxostoma dorsalis* by Dr. T. Charlton Henry from a specimen obtained by him at Fort Thorn, New Mexico. This description appeared in the number of the 'Proceedings' of the Academy of Natural Sciences of Philadelphia for May, 1858, on page 117. In the June number of the same publication, pages 117–118 of the May number were reprinted with some typographical changes. Among them the name of *Toxostoma dorsalis*, was altered to *Toxostoma crissalis*, under which name the species has since been known. In "Directions to Binder" for Volume 10 (1858) of the above mentioned 'Proceedings' there appears the following statement: "Pages 117 and 118 in the April and May numbers to be cancelled, and pages 117 and 118 at the close of the June number substituted for them." This name, *Toxostoma dorsalis*, evidently was intended to appear originally as *Toxostoma crissalis*, but the former has priority of publication. It is merely a mistake involving the use of another and entirely different word, not a typographical error, and was not corrected in the original publication, but at least a month later. Therefore, since mistakes in the original publication of scientific names can not be altered, this name, *Toxostoma dorsalis*, can not for this reason be rejected in favor of *Toxostoma crissalis*, as *Toxostoma dorsalis* is apparently not preoccupied or otherwise untenable. We must therefore call the Crissal Thrasher *Toxostoma dorsalis*.

In connection with the use of the generic name *Toxostoma*, it might be well to note that this word is not of neuter gender as currently used, but feminine, since its terminal element is an appelative noun, and, therefore, must be either masculine or feminine, whichever the original employer of the name may determine—in this case, feminine.—Harry C. Oberholser, *Washington, D. C.*

The Wheatear (*Oenanthe oenanthe leucorhoa*) in Eastern Pennsylvania.—On October 6, 1919, Mr. James R. Gillen saw a strange bird on the ground, near Lansdale, Pa., which in a general way reminded him of a Horned Lark, although he recognized it as something different. Procuring a gun, he shot it and presented it to his father, Mr. Thomas S. Gillen, who mounted it and added it to his collection. Being anxious to ascertain what sort of bird he had found, Mr. Gillen described it to me, and I at once suspected that it might be a Wheatear. Showing him a tray of skins containing some of this species he immediately picked out a female in winter plumage as the exact counterpart of the bird he had shot.

Thanks to Mr. Thomas S. Gillen, the specimen was later exhibited at a meeting of the Delaware Valley Ornithological Club, and its identity confirmed. This is the first record of the occurrence of the Wheatear

in the State.—Witmer Stone, *Academy of Natural Sciences, Philadelphia, Pa.*

Additional Notes on the Birds of Red Deer, Alberta.—In Mr. Taverner's article on the Birds of Red Deer (The Auk, 1919) he invites further information on that region, and the following notes are offered as perhaps worthy of record. They are from my own investigations on June 2 to 6, 1903, at Innisfail; June 19 to 26, 1906, at Red Deer and Innisfail; and May 30 to June 9, 1911, at Camrose and the Miquelon Lakes, fifteen miles north. The numbers are those of Mr. Taverner's list:

2, Holboell's Grebe. In nearly every medium-sized lake, this species was found to outnumber the Western by several to one. Though in spots, the latter was the more abundant. Lakes would be frequently found with a population of Holboell's exclusively.

4, Eared Grebe. Abundant in many of the smaller lakes.

5, Pied-billed Grebe. Rare.

10, Tern. A species thought to be the Common, was in hundreds on the Miquelons in 1911. None were taken for identification.

Hooded Merganser. One seen on June 3, another on June 6, 1911, at Miquelon.

Red-breasted Merganser. One at Miquelon, June 2, 1911.

Ring-necked Duck. Ten seen on Wavy Lake, June 3, 1903.

35, Great Blue Heron. The only spruce tree on the Pelican Island at Miquelon, June, 1911, had so many Cormorants' nests that one's clothes got very dirty in forcing through them to reach the top of the tree, where there were five nests of the Great Blue Heron. There were thirty or forty nests of the Cormorant.

Pectoral Sandpiper. Three.

Hudsonian Godwit. One.

Marbled Godwit, three.

All these at a little lake ten miles northeast of Camrose on June 6, 1911, also two more of the last named on May 30, 1911, near Camrose. The Hudsonian was in the spectacular cinnamon plumage which, with his long bill, made identification extremely easy.

51, Black-bellied Plover. One at the same place as the three above. I have also a skin taken near Edmonton on September 23, 1896.

53, Hungarian Partridge. Mr. Farley informs me that this species is approaching nearer to Camrose, and it is now affording fair shooting south of Calgary, appearing to be well suited by the prairie conditions.

73, Osprey. A nest was found at Pine Lake (a name that is of abundant occurrence in the west) twenty miles S. E. of Red Deer on June 2, 1906. The birds were feeding young, but were too wary to approach the nest while we were near. It was on a broken topped tree near the lake, about fifty feet up, and immediately below it, within six feet, a Red-breasted Nuthatch was incessantly going to feed her young.

89, Ruby-throated Humming-bird. One seen at Miquelon, June 2, 1911.

94, Olive-sided Flycatcher. Seen on two or three occasions. The presence of spruce ought to guarantee this species as a regular resident in fair numbers, and probably only a little search is needed to reveal it.

104, Cowbird. Common, ten to seventy daily in 1911, two to five daily in June, 1903.

108, Baltimore Oriole. I have no familiarity with the notes of the Bullock's Oriole, and have failed to identify it positively, but all the orioles which I have seen well, or shot, have been the Baltimore. One to ten each day at Camrose, 1911.

110, Rusty Blackbird. About as common as the Brewer's. Several nests found in the typical location, *over water*. One was shot to make identification positive, but it was unnecessary, as I am thoroughly familiar with both species. Exceptions doubtless occur, but I have never found nests of the Rusty other than over water, and Brewer's never very near water. Mr. Taverner would appear to have duplicated Mr. Farley's note "breeding along the streams in willows." Mr. Farley does not think he said it with reference to Brewer's, and if he did, it was a slip. He only finds the Rusty beside water.

114, Pine Grosbeak. My specimens vary in shade of color from the eastern ones, both in red and gray phases, but no stress is laid on this character in the western variety.

118, Redpoll. A bird of extreme abundance in winter. About 1900, a pair were held in captivity at Innisfail, and laid eggs and attempted to raise young, with what success the writer is not informed. Some bird-lovers of the region are beginning to leave some pig weed stems in the garden as an attraction for these regular visitors.

138, Arctic Towhee. Three to eight seen and heard daily at Innisfail, June, 1906.

Baird's Sparrow. Six seen June 6, 1903.

136, Swamp Sparrow. Recorded daily in June, 1903.

139, Rose-breasted Grosbeak. Observed daily in 1903 at Innisfail and a few were also seen at Red Deer in 1906. Small numbers were seen daily at the Miquelon Lakes in 1911.

145, Tree Swallow. Four to forty seen daily in June, 1911, and one to ten daily in June, 1903.

157, Tennessee Warbler. One of the common breeding warblers near Red Deer.

170, Redstart. Three to five seen daily in the four days at the Miquelon Lakes in June, 1911.

173, Sprague's Skylark. One to ten seen or heard daily in June, 1903.

178, Red-breasted Nuthatch. While watching for an Osprey to return to feed its young at Pine Lake, near Red Deer, on June 2, 1906,

we were entertained by one of these birds which was feeding young in the same stub about six feet below the Osprey's nest.

180, HUDSONIAN CHICKADEE. Taken at Edmonton, September 24, 1896.

183, OLIVE-BACKED THRUSH. One to ten daily near Red Deer in June, 1906.—W. E. SAUNDERS, *London, Ont.*

Birds of Irregular Occurrence on Long Island, N. Y.—The following were recorded at Orient, Long Island, during the winter of 1918–19:

Phalacrocorax auritus auritus. One December 9. This was probably a belated transient. Covering a period of twenty years the writer has not listed it more than three or four times in winter.

Nettion carolinense. One February 9. To be listed with the rarest of winter visitants near Orient.

Rallus elegans. On January 23, a fine specimen was taken in a steel-trap set for muskrats. Retained in the writer's collection. This is apparently a very uncommon species on Long Island at any time. It has been observed in Orient several times in mid-winter, where it is to be looked for at that season along the exposed mud-flats of the brackish creeks at ebb tides; hiding in the grasses when tide is flood.

Oxyechus vociferus. One February 13 and another, or the same bird, on the 14th. Although frequently recorded in December, January and March, this is the first February record for Orient.

***Sphyrapicus varius varius.** One December 22. Very rare and irregular in winter.

Molothrus ater ater. February 2, flock of eleven; February 7, flock of twenty-four; February 27, flock of eight. In recent years this species is fairly regular in winter. Usually in flocks.

Pinicola enucleator leucura. Three January 19; one February 1. This is the third winter that the writer has recorded stragglers since the great flight of 1903–4.

Carpodacus purpureus purpureus. One January 23. Never common near Orient and to be classed with the rarest birds in winter.

***Melospiza georgiana.** Wintered through in numbers. The colony of thirty seen on December 22 in a swamp. It appears to be a regular winter sparrow in Orient, though usually rare and local.

***Lanius ludovicianus migrans.** Seen on December 22 and on February 7. Rare, but not out of place on Long Island in winter.

***Geothlypis trichas trichas.** A female was seen through the mouth of November. Recorded on December 22 and again on January 28.

Dumetella carolinensis. One February 12. They occasionally winter in Orient, confining themselves to a favored locality, as a cedar grove, or other suitable haunt affording both food and shelter.

***Telmatodytes palustris palustris.** One December 22. This is the first winter record in Orient. The species is unknown in Orient in summer and has occurred only as a very rare fall transient.

The species starred were reported in the 'Bird-Lore' Christmas Census. Vol. XXI, No. 1, 1919.—Roy Latham, *Orient, N. Y.*

Rare and Uncommon Birds at Branchport, Yates Co., N. Y.—Macrorhampus griseus. Dowitcher.—While I was concealed in a blind at the marsh at Branchport, August 6, 1911, a Dowitcher came on the mud and I had it under observation with 8 power binoculars for nearly two hours. August 13 I saw another Dowitcher at this same place. This seems to be the only Dowitcher record for Yates County.

Sterna caspia. Caspian Tern.—My first record for Caspian Tern was May 2, 1912, when five of these beautiful birds were around Lake Keuka at Branchport all day long. Two more were seen May 4, four May 6, and two May 9. My next record was two birds seen May 11, 1915, and ten birds May 17 to 19, 1915. In 1916 none were seen. In 1917 two were seen April 25 (my earliest record) and two more July 15 (my only summer record). In 1918 three birds were seen May 6, and this year (1919) four were seen May 2 and two May 4.

Spinus pinus. Pine Siskin.—Two Pine Siskins were under the balsams in my yard the morning of May 10, 1912. Two more were in the road in front of my house May 12. May 20, 1917, I saw a flock of about twenty-five Siskins in the bushes and on the ground along the "Big Gully" north of Branchport.

Spatula clypeata. Shoveler.—Two Shoveler ducks were shot on the lake at Branchport, November 12, 1912, and brought to me for identification.

Sterna hirundo. Common Tern.—May 9, 1913, ten Common Terns appeared on the lake at Branchport where they were seen in company with Ring-billed and Bonaparte's Gulls until May 16, when they disappeared. May 11, 1915, there were several Common Terns with a small flock of Bonaparte's Gulls and they were again seen on May 25. May 3, 1917, two were seen with a large flock of Bonaparte's Gulls. May 20, more than twenty were seen and May 27 there were more than forty Terns on the lake. April 28, 1918, and again May 12, eight were seen with Bonaparte's Gulls. May 2, 4, and 11, 1919, from two to twelve Terns were seen. Prior to 1913 I had never seen a Common Tern on Lake Keuka, but now they seem to be of regular occurrence.

Ammodramus nelsoni subvirgatus. Acadian Sparrow.—June 3, 1913, I saw an Acadian Sparrow in the thick marsh grass at Branchport. I had a good look at it at a distance of only three feet, but after it disappeared into the grass I was unable to flush it again. October 5, 1919, I saw another Acadian Sparrow in this same place, and October 14 another one lit in the cat-tails only ten feet away.

Nettion carolinense. Green-Winged Teal.—November 21, 1913, a trapper told me that he had caught a small duck in one of his traps and that he had left it in a barrel beside his boat-house. I got the duck and

found it to be a female Green-winged Teal. It had been caught by the bill in a steel trap that was set for muskrats. This same man brought me a Green-winged Teal that he had shot October 8, 1914. The Green-winged Teal is rather rare in this locality.

Pinicola enucleator leucura. PINE GROSBEAK.—December 9, 1913, I saw a single female Pine Grosbeak in a locust tree in the streets of Branchport.

Hesperiphona v. vespertina. EVENING GROSBEAK.—I saw eight Evening Grosbeaks in a pear tree in the streets of Branchport the morning of March 28, 1916. They soon took flight and could not be again located.

Progne s. subis. PURPLE MARTIN.—A single Purple Martin stopped for a little while on the telephone wire in the street at Branchport, April 23, 1916.

Asio flammens. SHORT-EARED OWL.—November 2, 1916, a dead Short-eared Owl was picked up in the swamp at Branchport. Evidently it had been shot and left where it fell.

Aluco pratincola. BARN OWL.—May 27, 1917, a Barn Owl was brought to me by a young man who had shot it. He said that it was after his chickens. This is the first record of the Barn Owl for Branchport.—VERDI BURTCH, *Branchport, N. Y.*

Unusual Winter Bird Records for Iowa City, Iowa.—Although the early winter season has been unusually severe in this locality and cold weather has continued almost without intermission since late November, 1919, a number of species of birds which ordinarily winter farther south have remained with us. The minimum temperature to date has been—25° Fahr. and the ground has been practically covered with snow since early December. Among eighteen species of birds seen on December 26, 1919, between the hours of 8:00 A. M. and 2:30 P. M., the three following seem worthy of special mention.

Falco sparverius sparverius. SPARROW HAWK.—One example of this species was seen in a small wooded plot about one-half mile west of town. The bird was studied with the glasses at a distance of twenty yards. It was being tormented by a pair of blue jays which appeared to have no hesitancy in attacking the hawk, thus causing it to change its perch frequently in the tops of the trees. This is my first and only winter record for this bird.

Anderson (Birds of Iowa, Proc. Davenport Acad. Sci., XI, 1907, 257) says concerning the status of this hawk in Iowa: "A common migrant in all parts of the state and somewhat less common as a summer resident. * * * A male specimen was shot at Iowa City, November 28, 1905." Bailey (The Raptorial Birds of Iowa, Iowa Geol. Surv. Bull., No. 6, 1918, 170) adds: "Although rarely found with us during the winter, Mr. G. H. Berry, of Cedar Rapids, brought the writer one that was killed in the month of January while pursuing English Sparrows."

Colaptes auratus luteus. NORTHERN FLICKER.—A single individual was seen in a low, wooded area along the Iowa river one mile south of Iowa City. It was very wary and a close-up observation of the bird was impossible. This form has been reported in winter a few times locally but I have seen no published record of such occurrence.

Anderson (*l. c.* 278) remarks as follows concerning this bird: "Occasionally individuals are observed in winter. In Winnebago County, I have seen specimens in November, December and February, but very rarely during these months." Spurrell (Wilson Bull., XXI, No. 4, 1919, 120) gives the Northern Flicker as a rare winter resident in Sac County, western Iowa.

Pipilo erythropthalmus erythropthalmus. TOWHEE.—One individual, a male, was found in a sparsely wooded and somewhat sheltered hollow three-fourths of a mile west of town. Several houses are in the immediate vicinity of the brush pile where the bird was first seen and which probably served as his shelter. Attention was first called to the bird by the familiar *"chewink"* which was uttered several times; however, the calls were neither so loud nor so frequently given as is characteristic of the species in spring and summer. In an attempt to photograph this unusual winter resident, the writer approached to within fifteen feet of the bird when it flew to a nearby blackberry patch. It seemed to have a dislike for standing in the snow and immediately hopped upon a low bush; when pressed too closely it flew away a considerable distance before alighting.

Anderson (*l. c.* 326) gives this bird as a common summer resident. His winter records are as follows: A few in Van Buren County, a female near the Rock Island Arsenal and another individual at Webster City.—DAYTON STONER, *University of Iowa, Iowa City, Ia.*

Notes on Winter Birds of the Missouri Ozarks.—On February 2, 1920, after about five days of very warm weather for this time of year, I observed three Killdeers feeding together in a horse lot beside a slough. The previous earliest date in the spring, for Missouri, is February 17. Though I took no specimens, I was too close for any possibility of error in my identification.

On January 2, 1920, I saw and listened to a Bewick's Wren singing his full song for almost an hour. The day on which I heard him singing was very warm for January. Although I have observed the Bewick's Wren several times this winter, this is the first time that I had heard one singing since late in November. Up to date, February 7, I have not heard another.

On February 4, a friend brought me a fine female specimen of the Great Horned Owl. He had found it sitting on two eggs in a slight depression in the hay in a barn loft. There had been no apparent effort to arrange the hay in any way, and there were no sticks nor any sort of building material from the outside. I can find no record of a similar nesting of this species.—PREWITT ROBERTS, *Conway, Missouri.*

Mesa County, Colorado, Notes.—The following notes relate to birds which have not yet been recorded from this County, or are relatively rare within its limits, and warrant being placed on record so as to help round out our knowledge of avian distribution in the State:

Charitonetta albeola. Buffle-Head Duck.—A pair of these ducks stayed in a slough near the Sugar Factory at Grand Junction, having first been noticed there on April 18, 1918.

Oidemia deglandi. White-Winged Scoter.—In October, 1918, a flock of five females of this species was seen by J. W. Spencer, Forest Supervisor, at Mesa Lake, Grand Mesa. One is now a mounted specimen in the collection of the Riverside School of Grand Junction. The determination of this specimen was confirmed by Dr. W. H. Bergtold.

Astur atricapillus striatulus. Western Goshawk.—A single individual of this species was taken at Clifton in October, 1919; this specimen is now amongst the mounted birds of the Riverside School.

Falco peregrinus anatum. Duck Hawk.—On May 19, 1918, I secured a dead bird of this species, which had been found in the yard of Allen School (just east of Grand Junction). This specimen was sent to, and examined by, Dr. Bergtold, who confirmed my previous diagnosis.

Tyrannus tyrannus. Kingbird.—A pair of this species was seen by the writer at Grand Mesa, near Loma, on August 25, 1919.

Vermivora celata lutescens. Lutescent Warbler.—A single individual of this warbler was studied for a long time at close range on August 22, 1918, at Pinon Mesa.

Sitta canadensis. Red-breasted Nuthatch.—This species has been noted several times lately in or near Grand Junction; one was found dead within the city limits on March 10, 1917, during January, 1917, several were detected along the Grand River in its course through the city, quite a number were noted near my cabin which is located in the hills neighboring Grand Junction, during the summer of 1919, and on September 2 of that year one appeared at my residence in Grand Junction. I have also seen this species at Clifton.

Sitta pygmaea pygmaea. Pigmy Nuthatch.—Twelve individuals of this species were seen at Enoch's Lake, Pinon Mesa, on August 12, 1919, and a flock of about twenty birds was noted on August 21, 1918, and a smaller flock was seen on August 31, 1918, both flocks having been noted on the Mesa just mentioned.

Sialia mexicana bairdi. Chestnut-backed Bluebird.—This species was seen in Grand Junction on April 1, 1918, a pair was noticed feeding three young on Pinon Mesa on August 9, 1918, and during August of the same year nearly every flock of Mountain Bluebirds (*Sialia currucoides*) coming under my observation contained a few of the chestnut-backed species. This species is seen mostly at or above the 8000 feet level of latitude, and is seen in the "Valley" only during migration.—Ada B. Copeland, *Grand Junction, Colo.*

Some North American Birds Obtained in Japan.—Of North American birds which stand recorded in the literature as having been obtained in Japan, there are: The Buff-breasted Sandpiper, *Tringites subruficollis* (Vieill.), once obtained in the Province of Owari (Stejneger, Proc. U. S. Nat. Mus., Vol. XVI, 1893, p. 616); the Short-billed Gull, *Larus canus brachyrhynchus* Richardson, obtained in the Kurile Islands (Dresser, Man. Pal. Bds., p. 830); and Cassin's Auklet, *Ptychoramphus aleuticus* (Pall.), which occurred also in the Kurile Islands (Uchida, "Nihonchorui Zusetsu," Vol. I, p. 301). To the writer are known three more cases of North American birds having been met with as stragglers in Japan. They are as follows:

Mareca americana (Gmelin). BALDPATE.—A nearly adult male of this duck was obtained December 4, 1908, in the duck-decoy pond owned by me at Haneda, between Tokyo and Yokohama (Kuroda, Zool. Mag. Tokyo, Vol. XXI, 1909, p. 145). A second example, an adult male, of the same species, was captured at the same pond, January 16, 1918 (Kuroda, "Tori," Vol. II, No. 6, 1918, p. 52).

This remarkable duck seems to occur in Japan only as a rare straggler in migration, mixed in flocks of the European Widgeon (*M. penelope*). It is said that it is occasionally captured in the neighborhood of Tokyo. I have not yet seen a female example of this duck obtained in this country. Dr. Stejneger (Proc. U. S. Nat. Mus., 1887, p. 136) has recorded that a single straggler of the species was picked up dead on a sand-dune in Bering Island, and Dresser (Man. Pal. Bds., 1903, p. 616) has mentioned that the species occurred two or three times in Great Britain.

Nettion crecca carolinense (Gmelin). GREEN-WINGED TEAL.—A fully adult male, with white crescentic bands on each side of the chest, was obtained at Haneda in the same pond mentioned above, February 17, 1916 (Kuroda, Zool. Mag. Tokyo, Vol. XXVIII, 1916, p. 413). This is the only instance known to me of this teal having occurred in Japan. It is probably a rarer straggler in this country than the American Widgeon. According to Dresser (Man. Pal. Bds., 1903, p. 612) the teal in question had been obtained twice at least in Great Britain.

Xema sabini (J. Sabine). SABINE'S GULL.—A male of this gull in complete summer plumage was collected on the coast of Kesen-numa Bay in Prov. Rikuzen, November, 1909 (Kuroda, Zool. Mag. Tokyo, Vol. XXIV, 1912, p. 55). This is the only case known of its occurrence in Japan.

This Gull like the two species of duck already mentioned is properly an American species, of which some individuals are known to have been met with as accidental stragglers in Europe. Thayer and Bangs (Proc. N. Eng. Zoöl. Club, Vol. V, 1914, p. 11) have noted that it was not observed on the Arctic coast of Siberia, while Koren says he has examined a skin of the species in possession of a native at Nijni Kolymsk, East Siberia.—NAGAMICHI KURODA, *Tokyo, Japan.*

The Color of Natal Down in Passerine Birds.—Some years ago I started taking notes on the appearance of young birds when newly hatched. I found that young passerine birds differed widely, not only in size, but in color of skin and in amount, distribution and color of natal down. So far as I know, nothing has been published on this subject, except that Dr. Dwight has given the color of natal down of a good many passerine species. (The Sequence of Moults and Plumages of the Passerine Birds of New York.)

In a number of species of birds I have found the natal down white in color, among them the Red-winged Blackbird (*Agelaius p. phoeniceus*) and the Robin (*Planesticus m. migratorius*). I was rather surprised when I came to study Dr. Dwight's work to find that the down of these two species was given as mouse-gray. This year (1919) I verified my observations concerning the down of the newly-hatched Robin, and then also verified those of Dr. Dwight. My observations were all made from living young in the nest. Dr. Dwight tells me that his were made from the skins of juvenal birds, where the natal down still adhered to the feathers. A young Robin in just such a condition was brought me by one of my pupils for identification this spring. The down still adhering to the feathers was undoubtedly mouse-gray, and in great contrast to the color of the down of newly-hatched young of this species.

It seems, therefore, that either some pigment change occurs in the down, due to exposure to light and air, or what is more probable, that the dirt and dust of nest-life change the color of the down from white to gray. Whichever cause, it is evident that the down of a number of species is probably much lighter in color when the birds are hatched than examination of older specimens would indicate.—Aretas A. Saunders, *South Norwalk, Conn.*

Birds and Tent Caterpillars.—For a number of years prior to 1917 the Tent Caterpillar (*Malacosoma americana*) was unusually abundant in many parts of New England and perhaps in other places. Having been in the west until 1913 I do not know just when the scourge of these insects began, but I first noticed their great numbers at Newport, R. I., in the spring of 1913. The next few years the insects appeared to spread and increase in numbers. I noted them about Norwich, Clinton, New Haven, Bridgeport, and Norwalk, Connecticut, and in the spring of 1915 at St. Albans, Vermont, where they were even more abundant, if possible, than in Connecticut.

In the winter of 1916–17, the egg clusters of the tent caterpillar seemed as abundant as ever, and early in the spring these eggs hatched, and the nests of young caterpillars began to appear. I had made it a practise each winter and early spring to destroy the eggs or young caterpillars at every opportunity. As the spring of 1917 advanced, I soon found that my work had been done for me. Each nest that I visited, with

intention of destroying it, was empty of caterpillars, and usually had a large round hole through the web. At this time the caterpillars were still very small, less than half an inch long, and the nests were only a few inches across. The majority of people do not notice these nests until the caterpillars are full-grown, and their depredations on surrounding foliage begin to be extensive. For that reason many were of the opinion that there were none in the spring of 1917, and I have heard it stated that a fungus disease destroyed them in 1916. My observations go to show that they were still abundant early in 1917 and that they disappeared that year when only half-grown. A fungus disease may have had something to do with it, but a large part of the credit, according to my observations, goes to birds, at least in the vicinity of Norwalk.

It is generally known that this caterpillar is immune from the attacks of all birds but the Cuckoo because of its long hairs. It is my opinion that when the caterpillars are small, and the hairs decidedly shorter, that birds can eat them in case of necessity. The spring of 1917 was late and cold. After the middle of May came the great flight of warblers, thrushes and other insectivorous birds. Their arrival was coincident with the disappearance of the tent-caterpillars. Other insect life was scarce, and many birds died from cold or starvation. I actually observed a Parula Warbler (*Compsothlypis americana usneae*) and a Yellow-breasted Chat (*Icteria v. virens*) in the act of eating these caterpillars. The numerous empty nests with holes in them, such as a bird would make with its beak, were abundant evidence that what I had seen twice had taken place many times. How effectually the birds did their work was shown by the fact that only a single nest was observed in 1918 and none in 1919.—Aretas A. Saunders, *South Norwalk, Conn.*

RECENT LITERATURE.

Baldwin's 'Bird-Banding by Means of Systematic Trapping.'[1]— One of the most important contributions to bird-banding activities and the study of bird migration, of recent years, is Mr. S. Prentiss Baldwin's report of his operations at Thomasville, Georgia, and Cleveland, Ohio, during the years 1914–1918, which constitutes the principal article in the thirty-first 'Abstract of the Proceedings' of the Linnaean Society of New York, for the year ending March 11, 1919.

Mr. Baldwin found that a far greater number of "return" records could be obtained from the systematic trapping of birds in connection with banding them than by limiting one's operations to the banding of young birds in the nest and trusting to their possible discovery elsewhere. His paper is so full of valuable information and suggestions that everyone interested in the matter should read it in its entirety and we shall here quote only some of his more important results.

The work at Thomasville was carried on for from four to six weeks during three winters. Government sparrow traps were used, two the first two years and five the third. The birds seemed to regard the traps as feeding stations and were not frightened by being caught and handled, in fact the problem was rather to keep some individuals out of the traps than to entice them to enter. Some birds were in the trap every day, and out of 654 individuals taken 441 were records of birds that were taken more than once.

Two White-throated Sparrows banded at the Thomasville trap in 1915 were retaken in 1916 and another one in 1917, while four of those banded in 1916 were taken at the same place in 1917. No less than 25 of the birds banded in 1916 and six in 1915 were trapped again in 1917. Mr. Baldwin has thus demonstrated that migrants come back to the same place to winter year after year, and others have proven that they come back to the same spot to nest. He has also shown however that they do not always do so and he states that the average observer is all too prone to regard a pair of birds occupying a certain box or hole as the same pair that occupied it the year before. The chance he considers is about one in five that one of the pair will return and perhaps one in twenty-five that they both return.

In the case of House Wrens he shows that a pair reared a brood on his farm near Cleveland while a second brood in the same box was found to be the offspring of one of the original pair and a new mate, the other parent of the first brood, having also secured a new mate, was caring for a brood in another box. These facts as well as the return of birds to the

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[1] Abstract of the Proceedings of the Linnaean Society of New York. For the year ending March 11, 1919. No. 31, 1918–1919. Issued December 23, 1919.

same nest site have important bearing upon the question of whether birds mate for life, recently agitated in 'The Condor.'

As Mr. Baldwin points out, much valuable data on the age to which birds live, the length of time that migrants remain at a given spot on their line of flight, the return of young birds to the spot where they were raised, etc., may be secured by this method.

The practice of trapping renders bird-banding a much more attractive study with more definite returns, and we trust that Mr. Baldwin's success will lead others to follow his example. In this connection attention might be called to similar work that has been carried on in England, especially with reference to the movements of Starlings, where many records of individual birds have been obtained.—W. S.

Chapman on New South American Birds.[1]—Studies of various collections of South American birds received at the American Museum of Natural History have led Dr. Chapman to propose seventeen new species and subspecies and one new genus as follows: *Micropus peruvianus* (p. 253), Ollantaytambo, Peru; *Grallaria watkinsi* (p. 256), Prov. Piura, Peru; *G. boliviana* (p. 257), Cochabamba, Bolivia; *Synallaxis stictothorax piurae* (p. 257), Piura, Peru; *Phacelodomus striaticeps griseipectus* (p. 258), Cuzco, Peru; *Hylocryptus* (p. 258), new genus, *H. erythrocephalus* (p. 259), Alamor, Peru-Ecuador boundary; *Xenops rutilus connectens* (p. 259), Cochabamba, Bolivia; *Xiphorhynchus triangularis bangsi* (p. 260), Cochabamba, Bolivia; *Thripobrotus layardi madeirae* (p. 261), Rio Madeira, Brazil; *T. warscewiczi bolivianus* (p. 262), Incachaca, Bolivia; *Mecocerculus subtropicalis* (p. 262), Urubamba Canyon, Peru; *Anaeretes agraphia* (p. 263), Sta. Anna, Peru; *Mionectes striaticollis columbianus* (p. 264), Sta. Elena, Colombia; *Myioborus bolivianus* (p. 265), Incachaca, Bolivia; *Basileuterus luteoviridis superciliaris* (p. 265), Urubamba Canyon, Peru; *Pheucticus uropygialis terminalis* (p. 266), Urubamba Canyon, Peru; *Catamenia analoides griseiventris* (p. 267), Cuzco, Peru.

As is customary in Dr. Chapman's papers, the descriptions are full and there are numerous critical remarks upon allied forms, while all of the material examined is listed.—W. S.

Cory's 'Catalogue of Birds of the Americas.'—The second volume of Mr. Cory's comprehensive work,[2] constituting the second half of the second part, appeared on the last day of 1919. It covers the families, Trogonidae, Cuculidae, Capitonidae, Ramphastidae, Galbulidae, Buc-

[1] Descriptions of Proposed New Birds from Peru, Bolivia, Brazil, and Colombia. By Frank M. Chapman. Proc. Biological Society of Washington, Vol. 32, pp. 253–268. December 31, 1919.

[2] Catalogue of Birds of the Americas. By Charles B. Cory, Field Museum of Natural History Publication 203, Zoological Series, Vol. XIII. Part II, No. 2, pp. 315–607. Chicago, December 31, 1919.

conidae and Picidae, bringing the catalogue down to the Passerine families. The pagination, it will be noticed, is continuous with the first half of the part and the present instalment has an index to all the genera and species listed, as well as addenda and errata to the first part of the publication.

The general style of the work follows closely that of the first instalment but there are a number of new forms described of which there is no list and they could easily be overlooked in a casual examination of the volume. The propriety of publishing new names in this manner has already been discussed in these columns and we shall only add that where the practice is followed there should be a list of the new forms given somewhere in the publication. A painstaking search through the pages discovers the following, though it is possible that some have been overlooked: *Coccyzus minor caymanensis* (p. 336), Grand Cayman; *Nystalus maculatus nuchalis* (p. 398), *Soroplex campestris cearae* (p. 414), *Chrysoptilus melanochlorus juae* (p. 444), all from Ceara, Brazil; *Celeus elegans approximans* (p. 450), Boa Vista, Amazonia; *Chrysoptilus melanolaemus perplexus* (p. 442), Conchitas, Buenos Aires; *Chrysoptilus punctigula notata* (p. 446), "Colombia" and *Crocomorphus flavus peruvianus* (p. 457), Lagunas, Peru.

The propriety of basing a new name on a specimen with no more detailed locality than "Colombia," in these days of minute accuracy, is certainly open to criticism as it will prove a hindrance to anyone else working upon the genus *Chrysoptilus*. The "provisional" naming of another form (*perplexus*), which is not recognized in the list proper, in case the "differences prove constant," is also against present-day practices. A name that is once published with a description is established for all time, no matter whether it is properly and conspicuously printed or proposed provisionally and buried in a foot-note, and the author who adopts the latter method at once exposes himself to criticism.

Mr. Cory has done an important and tedious piece of work in bringing out this volume and it will be of great use to all who are interested in the avifauna of the New World. We happen to know that he has already made considerable progress on the next part and we trust that it will not be long before it is ready for the press and that the Field Museum will be able to carry on a publication which is of so much importance to all systematic ornithologists.—W. S.

Witherby's Handbook of British Birds.[1]—Part 6 of this important work, comprising pages 337–400, was issued January 12, 1920, and covers the warblers and part of the thrushes. One half-tone plate illustrates each group and there are a number of text cuts of wings, tails, etc. The

[1] A Practical Handbook of British Birds. Edited by H. F. Witherby. London, Witherby & Co., 326 High Holborn, W. C. I. Part 6, Jan. 12, 1920. Price 4s. net per part.

standard of treatment is fully up to the preceding parts and the description of the plumages of the warblers very full and detailed. We are informed that the two remaining parts needed to complete Volume I and the order Passeres, will be issued together on April 6.—W. S.

A Geographical Bibliography of British Ornithology.[1]—Part 2 of this excellent bibliography, the initial number of which was noticed in our last issue, was published early in January. It covers the county lists and notes from Essex to Middlesex in alphabetical order. The quotation from Gilbert White's Selborne which appears on the cover is appropriate and could well be taken to heart by many bird students today who, while lacking time and opportunity for broad scientific work, may produce valuable results by specializing upon a limited locality. The lines referred to are as follows: "Men that undertake only one district are much more likely to advance natural knowledge than those that grasp at more than they can possibly be acquainted with; every kingdom, every province, should have its own monographer." This part is beautifully printed like its predecessor and is a handsome publication.—W. S.

Annual Report of the National Association of Audubon Societies. The fifteenth annual report of the National Association of Audubon Societies,[2] a pamphlet of over one hundred pages, demonstrates once more the splendid work that this organization is accomplishing. We are becoming so accustomed to hearing of the work of the National Association that we are likely to imagine that we have always had it with us and it would be well if some of those who read the pages of this year's report would turn to the reports of the A. O. U. Committee on bird protection published in 'The Auk' twenty years and more ago, in order to better realize present-day conditions.

Among the leading topics in the report of the Secretary, Mr. T. Gilbert Pearson, we may mention just a few: the seizure of $150,000 worth of illegally imported plumes by the customs authorities at New York; the raising of $13,000 toward the erection of a Roosevelt memorial bird fountain and the ornithological education in the past nine years of no less than one million children in the schools of the country. The appeal for an endowment fund to further develop and maintain this work is certainly warranted.

The work of the wardens is also well worthy of careful consideration and the reviewer, who enjoyed the privilege of visiting the Breton Island

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[1] A Geographical Bibliography of British Ornithology from the Earliest Times to the End of 1918. By W. H. Mullens, H. Kirke Swann, and Rev. F. R. C. Jourdain. Witherby & Co., 326 High Holborn, London, 1920. Part 2, Price 6 s. net.

[2] Bird Lore XXI, No. 6, pp. 395–502.

Reservation with Warden Sprinkle last spring, can testify to the painstaking devotion of these men to the work that they have undertaken and the need of more adequate remuneration for their services. The patrol of the government reservations has now passed from the Audubon Societies to the Biological Survey of the U. S. Department of Agriculture, where it properly belongs. The long list of reports of allied and State societies contain much of interest and illustrate how widespread the interest in popular bird study has become.

In the face of this most encouraging report it is distressing to turn to the editorial in the last issue of 'Bird-Lore,' in which we learn of the action of Legislatures and Congress leading to the drainage and opening to settlement of portions of the Klamath Lake Reservation in Oregon and California. The former operations have already converted part of the lake into a desert, and the only hope for saving this most important refuge seems to lie with the Secretary of the Interior whose interest might be aroused if sufficient appeals were made to him.—W. S.

Bulletin of the Essex County Ornithological Club.[1]—This attractive publication introduces a new bird club apparently of a type of which we cannot have too many. We have only praise for the numerous "Audubon" clubs which are springing up all over the country, but of necessity their activities are so completely taken up with conservation of wild life and the furthering of popular and elementary nature study, that the more serious side of ornithology, such as has engaged the attention of the "Nuttall," "Cooper" and "Delaware Valley" Clubs, has not come within their scope. The mingling of the two activities in one organization has not been productive of very happy results and we therefore welcome the organization of "ornithological" clubs wherever the material for such clubs exists. The presence of an "Audubon" club in the same community in no way complicates the situation and members of the former may readily be also active in the latter. The Essex County Club, like two of the three mentioned above, is a men's club and was formally organized in 1916, although a nucleus had existed since 1907 as the "Ipswich River Bird Trip." The present officers of the club are: President, Frank W. Benson; Vice President, Albert P. Morse; Secretary, Ralph Lawson; and Treasurer, Albert B. Fowler; and the meetings are held at the Peabody Museum at Salem, Mass.

Besides the account of the founding of the Club, By-Laws, Calendar and List of Members, the present publication contains an article on the 'Identification of Hawks in the Field' by Dr. C. W. Townsend; 'Thirteen Ipswich River Bird Trips' by Ralph Lawson, with a list of 136 species observed; 'Coöperative Effort in Bird Study' by Arthur A. Osborne; and 'Told Around the Big Table'—a department for general notes. Under

[1] Bulletin of the Essex County Ornithological Club, December, 1919. Salem, Mass. pp. 1–55. Price 50 cts.

the last head we notice that the contributions are signed only with the initials of the authors, a practice which sanctioned by custom in the case of reviews is certainly open to criticism in the case of scientific contributions.

In looking over the various records we wonder if the observer of the Connecticut Warbler in May fully realized the excessive rarity of this species in the east, in spring, or was familiar with the plumage of the female Mourning Warbler which has a more or less conspicuous eye-ring and bears a striking resemblance to the Connecticut. Mr. Brewster's statement that there was not a single spring record of the bird in any part of Massachusetts in which he had full confidence, is significant.

We wish the Essex County Club every success and trust that the present publication is the forerunner of a series of valuable bulletins upon the bird life of the district.—W. S.

Hollister's Account of the National Zoo.[1]—In the Report of the Smithsonian Institution for 1917, published in 1919, there is an admirable popular account of the animals in the National Zoological Park, prepared by the director, Mr. Ned Hollister. It is fully illustrated by half-tones from photographs and a number of these are devoted to the birds, the Californian Condor, Whistling and Trumpeter Swans being among the more notable of the North American species. Among foreign species figured are the Horned Screamer, Cape Barren Goose—inadvertantly marked "Barren Ground Goose"—Black and Mute Swans, etc.

This pamphlet should serve an excellent purpose in producing a more intelligent interest in foreign birds and mammals. The great trouble with American systematic zoologists until quite recently has been that they have dealt almost exclusively with North American species and the broadening of the field in the present generation is most encouraging. In furthering this tendency our zoological gardens offer the best opportunities but too often there is a lack of accessible information about the mammals and birds that may be on exhibition. Mr. Hollister's "popular account" furnishes just what is needed, and may lead many a young student to a wider study of mammalogy and ornithology than he would otherwise have followed.—W. S.

Cory's Review of the Genus Rhynchocyclus.[2]—In this useful paper Mr. Cory gives the results of his study of the specimens belonging to this genus in the collection of the Field Museum of Natural History.

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[1] The National Zoological Park: A Popular Account of Its Collections. By Ned Hollister. From the Smithsonian Report for 1917, pages 543–593, with 46 plates. Washington, 1919.

[2] The Relationships and Geographical Distribution of the Species and Races belonging to the Genus Rhynchocyclus. Proc. Biological Society of Washington. Vol. 32, pp. 217–224. December 31, 1919. By Charles B. Cory.

As a result he recognizes eight species as follows, with the number of subspecies into which each is divided: *sulphurescens*, with six subspecies; *cinereiceps*, with two; *peruvianus*, with two; *marginatus*, two; *megacephalus*, one; *poliocephalus*, three; *grisescens*, one; and *flaviventris*, three. There is a full synonymy and discussions of relationship, with reprints of a number of the original descriptions.—W. S.

Recent Papers by Bangs and Penard.—These authors have recently considered the proper name for the Common Jungle Fowl[1] and decide that it should be *Gallus gallus gallus* (Linn.), the fact that this name was based upon a domestic variety in no way invalidating it. They select Bengal as the type locality. The other two races will therefore become *G. g. bankiva* Temminck, from Sumatra, and *G. g. ferrugineus* (Gmel.), from China.

Mr. Penard calls attention[2] to some untenable names. One, *Planchesia fusca* (Bodd.), is preoccupied and, as there is no other available, he proposes *P. pullata* (p. 21). *Muscicapa sibirica fuliginosa* (Hodgson) being also preoccupied, *M. c. cacabata* (p. 22) is proposed. For the same reason *M. ferruginea* (Hodgson) becomes *M. cinereiceps* (Sharpe) and *Eophona melanura melanura* (Gmel.) becomes *E. migratoria pulla* (p. 22), nom. nov. In another paper,[3] Mr. Penard describes as new from Mt. Roraima, British Guiana: *Chloronerpes rubiginosus roraimae* (p. 29) and *Tanagra violacea rodwayi* (p. 30).

Mr. Bangs has also proposed[4] as a new form, *Buteo lineatus eximus* (p. 35) from the Florida Keys.—W. S.

Van Oort's 'Birds of Holland.'[5]—Part 5 and the plates of Part 6 of Dr. Van Oort's notable work are now before us, the text to the latter to appear with Part 7. The ten plates of Part 5 illustrate the geese and brant, while those of the next part comprise the Shelldrakes (*Casarca* and *Tadorna*), the Mallard, Gadwall and three species of Teal. The various plumages are fully illustrated, including the summer or "eclipse" plumage of the males, in such species as exhibit this interesting phase. The high standard of both text and plates as described in reviewing the earlier parts is fully maintained.—W. S.

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[1] The Name of the Common Jungle Fowl. By Outram Bangs and Thomas Edward Penard. Proc. N. E. Zool. Club, Vol. VII, pp. 23–25. October 31, 1919.

[2] Some Untenable Names in Ornithology. By Thomas Edward Penard. *Ibid.* pp. 21–22, October 31, 1919.

[3] Two New Birds from Roraima. By Thomas Edward Penard. *Ibid.* pp. 29–31, December 23.

[4] A New Red-shouldered Hawk from the Florida Keys. By Outram Bangs. *Ibid.* pp. 35. January 16, 1920.

[5] Ornithologia Neerlandica. De Vogels van Nederland door Dr. E. D. Van Oort. Leiden, Martinus Nijhoff. Part 5 text and plates; part 6, plates only.

Kirk Swann's 'Synoptical List of the Accipitres.'[1]—This useful list is continued from *Herpetotheres* to *Pernis* in the present instalment, completing eighty genera. We notice that our American White-tailed Kite is regarded as a subspecies of the Australian *Elanus axillaris*. With actual intergradation out of the question this disposition of the bird must have been made upon the claim of overlapping of characters, but we fail to find the claim sustained upon an examination of material at hand, though it is interesting to note the resemblance between the two species in connection with the arguments for a relationship between the Australian and South American faunas which have from time to time been published.

This instalment of Mr. Swann's work contains an additional list of ten species and subspecies omitted from the preceding parts, among which we notice *Spizaetus batesi* W. Sclater, which we regard as identical with *S. africanus* Cassin.—W. S.

Dr. Shufeldt's Bibliography.—In the 'Medical Review of Reviews' for January, 1920,[2] there is begun a bibliography of the writings of Dr. R. W. Shufeldt prepared by himself, with a short introduction from which we learn that since the appearance of his first paper in 1881, he has published from twenty-five to thirty papers or books annually, the total at the present time numbering considerably over 1500. The subjects while largely biological, cover a wide range of topics. The present instalment runs to the end of 1888 and carries the list to No. 201. The author's papers, as is well known, are so widely scattered that a bibliography of this sort will be a convenience to those who wish to consult them, and surely no one is so well fitted for compiling the list as the author himself. Our only regret is that the biographical portion is not more complete.—W. S.

Stuart Baker on Egg Collecting and Its Objects.—It is very gratifying to have an article on egg collecting from one who is himself a collector and yet who fully appreciates what is meant by the word science. When the scientific ornithologist has attempted to point out the weak points in egg collecting, he receives scant attention from the egg collector who considers that he knows nothing about the subject, while many a collector who claims to be collecting for "scientific" purposes fails to show the slightest appreciation of the meaning of that term.

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[1] Synoptical List of the Accipitres (Diurnal Birds of Prey) Part III. January 20, 1920, pp. 77–114. Price, 4 shillings.

[2] Complete List of My Published Writings. With Brief Biographical Notes. (First Instalment.) By R. W. Shufeldt, M. D., Major, Medical Corps, U. S. Army. Medical Review of Reviews, XXVI, No. 1, January, 1920, pp. 17–24. Frederick H. Robinson, senior editor, 51 East 59th St., New York City, N. Y. Price per number, 25 cents.

Mr. Baker starts out with the quotation of a leading ornithologist: "Of egg collectors we have many, of oölogists, alas! but very few," which he says is "a very true summing-up of the situation, however depressing it may be." He goes on to say that the basal idea of those egg collectors who have *some* object in view is to ascertain and record the color and description of the eggs of each species of bird, but he adds, all such preliminary work has already been done. The real work now is to discover the underlying reasons for coloration and peculiar shape and the method of adaptation and eliminative protection. There is also the study of relationship in egg structure between birds of different families and genera as an aid to working out the true classification of birds, as well as the study of geographic variation in eggs in connection with the range of the species and the recognition of subspecies.

"The crudest and most deservedly abused form of collector," says Mr. Baker, "is the man sets out with the ambition of filling one box or drawer with the eggs of one species. Such collections merely form a mass of beautiful dead things which gratify his eye and sense of possession." He also warns against making a specialty of abnormal sets for such a collection, while it may be very beautiful is "scientifically almost useless," since all scientific work must be done upon normal sets.

There are great opportunities for developing "oölogists" out of our host of "egg collectors" if they are guided in the right paths, and Mr. Baker's paper may be read with profit both by the collector and by those who are opposed to collecting. Incidentally the journal in which the paper appears, 'The Oologists' Exchange and Mart,'[1] is an admirable little publication dealing with the serious side of egg collecting and well worthy of perusal by American oölogists.—W. S.

Economic Ornithology in Recent Entomological Publications.—Allusions by entomologists to the bird enemies of various insects are cited and discussed in the following paragraphs, each devoted to a different insect or group of insects.

False wireworms (*Eleodes*).—These are the larvae of beetles of the family Tenebrionidae, which are injurious in western states to grain, fruit and garden crops. The author of the paper reviewed[2] notes from various sources that Burrowing Owls, Butcher Birds, Crows, Crow Blackbirds and Red-headed Woodpeckers prey upon these beetles and further states that adults have been found by the Biological Survey in stomachs of 13 species of birds. This record may now be considerably improved. The most important economic species of false wireworm (*Eleodes tricostata*) has been found in the stomachs of eight species of birds, as follows: Frank-

[1] The Oologists' Exchange and Mart. Kenneth L. Skinner, Editor, Brooklands Estate Office, Weybridge, England. Subscription, $1.25 per year.

[2] McColloch, J. W. Journ. Ec. Ent., Vol. II, No. 2, April 1918, pp. 219–220.

lin's Gull, Upland Plover, Red-headed Woodpecker, Lewis's Woodpecker, Crow (in 21 stomachs), Crow Blackbird, Meadowlark, and Curve-billed Thrasher. Various other species of *Eleodes* have been found to be eaten by the following 16 birds in addition to the eight just named: Avocet, Sparrow Hawk, Burrowing Owl, Great-horned Owl, Hairy Woodpecker, Red-shafted Flicker, Road-runner, Horned Lark, Arkansas Kingbird, Magpie, Brewer's Blackbird, Yellow-headed Blackbird, Loggerhead Shrike, Mockingbird, Sage Thrasher, and Robin. The total list of known bird predators on *Eleodes*, therefore, is now 24. Of these, the crow, magpie and roadrunner probably are the most effective.

Lotus borer (*Pyrausta penitalis*).—This moth larva feeds on a variety of plants but seems to damage man's interests only when feeding on the American lotus. The larvae frequently destroy every seed in the receptacle of this beautiful waterlily. In an account[1] of the species, Dr. F. H. Chittenden states that blackbirds are said to eat the larvae before they go into shelter. In July, 1919, the reviewer had an opportunity to observe an infestation of *Nelumbo* by this species at the Dardenne Lakes, Missouri, and the work of blackbirds against the pest. A large proportion of the receptacles of the water chinquapin were blasted and the exit holes of the larvae with the accompanying frass and silk gave a clue to the pests, good specimens of which were soon found. Red-winged Blackbirds were observed working at the receptacles and investigation showed they knew well how to dig out the larvae. All of the infested receptacles near the fringe of trees in which the birds perched, seemed to have been freed of the lotus-borers.

Round-headed apple-tree borer (*Saperda candida*).—Mr. Fred E. Brooks says that this species is the most destructive in the eastern United States of any of the several kinds of insects that injure apple-trees by boring into the bark and wood. Birds are the only important enemies, and the author states[2] that "Woodpeckers destroy great numbers of the borers by removing them from their burrows. . . . In some cases from 50 to 75 per cent. of the borers are destroyed in this way. . . . Probably both the hairy and downy woodpeckers feed on the borers." It should be noted that Mary Treat has definitely recorded[3] that the Downy Woodpecker and Flicker feed upon this pest.

The Biological Survey has found beetles of the same genus as the apple-tree borer in stomachs of the Laughing Gull, Cassin's Kingbird, Magpie, Bluejay, Meadowlark, Red-eyed Vireo and Robin.

Flat-headed apple-tree borer (*Chrysobothris femorata*).—The same author quoted with reference to the preceding pest, notes[4] that Woodpeckers devour also many flat-headed borers, and gives the names of three species

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[1] Journ. Ec. Ent., Vol. II, No. 6, Dec. 1918, p. 457.
[2] Farmers' Bul. 675, U. S. Dept. Agr. Revised, Sept. 1919, p. 12.
[3] Journ. N. Y. Ent. Soc., Vol. I, 1893, p. 17.
[4] Farmers' Bul. 1065, U. S. Dept. of Agriculture, Oct. 1919, p. 9.

of birds, in the stomachs of which adults have been found by the Biological Survey. This list can now be increased to five species: the Kingbird, Crow, and the Red-eyed, Warbling, and Yellow-throated Vireos. Beetles of other species of the same genus have been found in stomachs of 11 kinds of birds, namely, the Downy, Hairy and Red-headed Woodpeckers, Kingbird, Phoebe, Wood Pewee, Crow, and the Red-eyed, Solitary, Yellow-throated and White-eyed Vireos.

Striped Cucumber Beetle (*Diabrotica vittata*).—While this is one of the pests that ravage truck crops every year, evidently not being appreciably checked by its enemies, still it is of interest to know what these are. One of the recent bulletins prepared in the Bureau of Entomology cites from Biological Survey records[1] the names of 15 bird enemies of the striped cucumber beetle. Two names can now be added to the list, viz.: Red-eyed and Philadelphia Vireos.

Grain bug (*Chlorochroa sayi*).—In recent years this species has become a pest of considerable importance in the Great Basin and Southwestern States, blasting the newly formed heads of cereals, to such an extent in some instances as to cause the crop to be cut for forage. Authors of a bulletin on this pest say:[2] "The offensive odor secreted by the scent glands of *Chlorochroa sayi* has been commonly supposed to protect them from the attacks of predatory enemies." However, the insect has "quite a variety of both vertebrate and invertebrate enemies." The Biological Survey is quoted as authority for reporting the grain bug from stomachs of the nighthawk and western meadowlark, and related species from the stomachs of five other species of birds. The latter list may now be increased to eight, including: Franklin's Gull, Bobwhite, Nighthawk, Kingbird, Magpie, Eastern Meadowlark, Brewer's Blackbird and English Sparrow.

White-grubs (*Phyllophaga*).—These are the larvae of the so-called May-beetles or June-bugs, the more familiar generic name for which is *Lachnosterna*. Their destructiveness, in grain fields, pastures, lawns and elsewhere need not be detailed here: suffice to it say they are among the most important insect pests and constantly receive the close attention of economic entomologists. Mr. John J. Davis, in a recent treatise[3] of the natural enemies of *Phyllophaga*, says: "On account of the difficulty of controlling the common white grubs, which pass ninety-five per cent. of their life under ground, their natural enemies are of unusual importance to the farmer." It is of much interest, therefore, that the author in this formal treatise on the enemies of these pests, should state that: "Birds are

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[1] Chittenden, F. H. Farmers' Bul. 1038, U. S. Dept. Agriculture, May 1919, p. 10.

[2] Caffrey, D. J., and Barber, Geo. W. Bul. 779, U. S. Dept. Agriculture, June 1919, p. 31.

[3] Bull. Ill. Nat. Hist. Survey, Vol. 13, Art. 5, Feb. 1919, pp. 53–138. Pls. 3–15, 45 figs.

among the most efficient . . . more especially in the newer regions where they are still to be found in large numbers." He mentions 52 species of birds among which probably the crow and the crow blackbird are the most valuable. Mr. Davis has gathered together and abstracted most of the information in economic publications on the bird enemies of Phyllophaga, but his total of 52 species can be largely increased if we take into consideration unpublished records of the Biological Survey. Phyllophaga adults and larvae have been found in the stomachs of 83 species of birds of the United States. The common crow is pre-eminent as an enemy of both adults and larvae. Other birds especially worthy of mention in the latter role (from a total of 15 species) are the Upland Plover, Rusty Blackbird and Robin, and in the former (from a total of 81 species) the following named approximately in the order of their importance: Starling, Crow Blackbird, Meadowlark, Brown Thrasher, Robin, Nighthawk, Chuck-wills-widow, Whip-poor-will, Screech Owl, Kingbird, the five species of *Hylocichla*, and these ten of about equal rank: Red-winged Blackbird, Upland Plover, the two Cuckoos, Flicker, Blue-jay, Catbird, Red-headed Woodpecker, Mockingbird, English Sparrow, Magpie and Towhee.—W. L. M.

Pine-seed Eaters in British Garhwal.—An interesting note on this subject by A. E. Omaston, may be called to the attention of ornithologists. The Chir Pine (*Pinus longifolia*), says[1] the author, is a tree which produces large quantities of edible seeds, but it is eaten by so many animals that one is forced to marvel how sufficient seed survives to bring about the complete natural regeneration which is so characteristic of the species. In this case, as in many others, nature is lavish, providing against all possible losses. Birds mentioned as important consumers of Chir seeds are: Eastern Wood-pigeon (*Palumbus casiotis*), a Nutcracker (*Nucifraga hemispila*), two species of Pied-Woodpeckers (*Dendrocopus himalayensis* and *D. auriceps*), and the Black and Yellow Grosbeak (*Pycnorhamphus icteroides*). The article contains also interesting notes on the local distribution and habits of these birds.—W. L. M.

The Ornithological Journals.

Bird-Lore. XXII, No. 1. January–February, 1920.

The Ring-Necked Pheasant. By Verdi Burtch.—Has become quite common in western New York, where it has taken the place of the Ruffed Grouse as a game bird.

Bobbie Yank. By Katrine Blackinton.—Account of a White-breasted Nuthatch.

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[1] Indian Forester, Vol. 44, No. 10, Oct. 1918, p. 463.

The Staghorn Sumac. By E. A. Doolittle.—As a bird-attracting shrub.

The Twentieth Christmas Bird Census, brings forth 169 lists from all parts of the country. We notice considerable diversity in the recording of Chickadees. From many localities quite beyond the range of *carolinensis* they appear simply as "Chickadee." At Mt. Holly, N. J., they appear, no doubt correctly, as "Carolina Chickadee," while at Moorestown, N. J., a few miles farther south, the record is of "Black-capped Chickadees." In such a winter as the past one both kinds no doubt occurred in central and southern New Jersey, but at the two localities mentioned the Carolina is certainly the usual one. It would seem better to use "Chickadee" without any qualifying term where there would seem to have been an error. In connection with the lone Tree Swallow at Gardiner's Island, N. Y., it may be of interest to know that this species was quite common at Cape May Point, N. J., on December 31, 1919, flying over the frozen lake and feeding on the wax myrtle berries as observed by the reviewer.

As to the Northern Phalarope at Telford, Pa., to which special attention is called in the introduction, a little investigation would have shown serious doubt as to the correctness of the identification.

The Condor. XXII, No. 1. January–February, 1920.

Autobiographical Notes. By Henry W. Henshaw.

A Return to the Dakota Lake Region. By Florence M. Bailey.—These two continued articles maintain their interest.

Importance of the Blind in Bird Photography. By Frank N. Irving. Illustrated with admirable close-up photographs of the Flicker at its nest, showing more clearly than any pictures that we have seen the method of perching of this species.

The Rusty Song Sparrow in Berkeley and the Return of Winter Birds. By Amelia S. Allen.—A Yukutat Fox Sparrow which was a regular visitor to a feeding shelf was banded and returned the next winter; while a Rusty Song Sparrow, supposedly the same bird, returned for three successive winters. These data are of particular interest in connection with Mr. Baldwin's work (see p. 314).

A Peculiar Feeding Habit of Grebes. By Alexander Wetmore.—The habit of eating feathers practiced by birds of this family may, the author suggests, be for the purpose of providing a "strainer" which checks the passage of fish bones and scales into the intestines until they are fully disintegrated. A brush-like fringe of corneous filaments supposed to serve a similar purpose is present around the pyloric opening in the Anhinga, a bird of similar feeding habits.

Notes on the Limicolae of Southern British Columbia. By Allan Brooks.—Notes on 38 species.

Edward Garner, A Pioneer Naturalist. By H. C. Bryant.

Description of a New *Otocoris* from California. By Harry C. Oberholser.—*O. alpestris sierrae* (p. 34), the Sierra Nevada in California from Placer to Lassen Counties.

The Oölogist. XXXVI, No. 12. December 1, 1920.

Some Nesting Birds of the Palisades Interstate Park. By P. M. Silloway.—Including a record of the breeding of the Black-throated Blue Warbler at Highlands, N. Y.

Among the Birds of the Virginia Coast. By B. R. Bales.—This article dealing apparently with Cobb's Island calls attention to the fact that egging is still carried on there (1919) on a large scale.

Bachman's Sparrow in Arkansas. By H. E. Wheeler.—An accompanying illustration is labelled nest of Bachman's "Warbler," but we suppose this to be an error.

The Oölogist. XXXVII, No. 1. January 1, 1920.

Turkey Vultures Feeding. By Winsor M. Tyler.—A careful piece of observation.

New Hampshire Notes. By S. T. Danforth.—Many records of interest.

The Ibis. (11th Series), II, No. 1. January, 1920.

Further Ornithological Notes from the Neighborhood of Cape San Antonio, Province of Buenos Ayres. Part III, Phoenicopteridae–Rheidae. By Ernest Gibson.—The present instalment brings to a close this valuable paper, a supplement as it were, to the 'Argentine Ornithology' of Sclater and Hudson, better known and more in demand than ever before since the reputation of Mr. Hudson has become so widespread. In one of his comments upon this work, Mr. Gibson calls attention to the erroneous attitude of the Black-necked Swan in the plate of this species, the neck being curved and the back elevated, whereas this species is one of the "stiff-necked" Swans with a straight back. The Coscoroba Swan, however, does curve the neck as depicted. This error in posture has extended to other "stiff-necked" species as well.

List of the Birds of the Canary Islands, with detailed reference to the Migratory Species and the Accidental Visitors. Part V. Alcidae–Phasianidae. By David A. Bannerman.—Another instalment of this carefully prepared paper.

Notes on the Birds of Quetta. By Col. R. Meinertzhagen.—The results of a two years' study of the avifauna of this locality in the highlands of Beluchistan. In his method of presentation the author attempts a suppression of the subspecies which, like similar attempts in America, causes more or less confusion. The binomial names appear in bold-faced type with the trinomials under them in italic precisely like the treatment of synonyms or references in other papers in the same issue. It seems high time for a universal "Systema Avium" when we encounter so many methods of nomenclature in vogue that it requires some study to ascertain just what the author is trying to do.

Notes on the Birds of Southern Palestine. By Col. R. Meinertzhagen. Another valuable list by the same author, with the same system of nomenclature.

Ornithology of the Maroccan [sic] "Middle-Atlas." By Captain Lynes.—This paper, while no doubt containing valuable information, is the most remarkable publication to appear in an ornithological journal in the experience of the reviewer. It appears to be the contents of a field notebook printed verbatim, and abounding in abbreviations of the most remarkable sort, marginal dashes, and sentences that have absolutely escaped the editing of either author or editor.

As an example we may quote the following under the Shore-Lark which is called "*Eremophila alpestris* (*? atlas* Whit.):

Coll. 8 ♂ ad., 4 ♀ ad. 23.5 to 10.7; ♂ ad. + ♀ ad. +N., 2e. 2d. 9.6; 1 juv. ab. 12.6 ? R. com. Plat. Almost certainly *atlas* (a specn. sent to Sicily to compare with type).

N. of 9.6 prob. second laying. My first acq. with Plateau, 23.5; shot ♀ carrying "stonefly," obv. to young. From bare breast, think ♂ shares incub.," etc.

Even with a page of explanations of abbreviations, life is too short to take the time to decipher such records!

Bulletin of the British Ornithologists' Club. No. CCXLV. December 8, 1919.

A large number of new forms are described in this issue. Dr. Hartert proposes *Ammoperdix heyi nicolli* (p. 4), Wadi Hof, Egypt; Mr. D. A. Bannerman shows that the two names, *Lampribis cupreipennis* and *L. olivacea*, refer to the same species and proposes for the Prince's Island (Gulf of Guinea) bird *L. rothschildi* (p. 6); he also names *Cercococcyx mechowi wellsi* (p. 7), from Cameroon, and *Sarothrura somereni* (p. 8), from British East Africa. Messrs. Robinson and Kloss present descriptions of ten new Malay birds and Dr. V. G. van Someren nineteen from Africa. Mr. Stuart Baker describes *Galloperdix spadicea stewarti* (p. 18), Travancore. Capt. Lynes describes *Sitta europaea atlas* and *Erithacus rubecula atlas* (p. 32), from Morocco but his descriptions are very meager and no types are indicated. W. L. Sclater presents descriptions of *Spizaetus nipalensis fokiensis* (p. 37), Fokien, China; *Spilornis cheela ricketti* (p. 37), Fokien; *S. c. kinabaluensis* (p. 37), Mt. Kinabalu, Borneo; *S. c. palawanensis* (p. 38). Palawan and *Pernis celebensis steerei* (p. 41), Negros, Philippines. C. Chubb describes *Legatus albicollis successor* (p. 43), British Guiana, and *L. variegatus nevagans* (p. 43), Panama, but gives no data for his types. G. M. Mathews contributes descriptions of two new Australian races.

Bulletin of the British Ornithologists' Club. No. CCXLVI. December 31, 1919.

Stephenson Clarke describes five new birds from Somaliland, including a new genus *Warsanglia* (p. 48), apparently related to *Pseudacanthis* from Yemen, and widely different from any known African bird. But one specimen is known which becomes the type of *W. johannis* (p. 48). J. D. La Touche presents descriptions of four new forms from Hupeh, and

V. G. van Someren sixteen from Africa. E. Hartert describes *Turdus citrinus courtoisi* (p. 52), from eastern China. E. C. Stuart Baker contributes *Carine brama fryi* (p. 60), Madras, and C. Chubb proposes *Serpophaga helenae* (p. 61), Bartica, British Guiana, and *Myiodynastes solitarius duncani* (p. 62), Supenaam and Aarwai Rivers, British Guiana.

Bulletin of the British Ornithologists' Club. No. CCXLVII. January 30, 1920.

Stephenson Clarke describes *Heteromirafra archeri* (p. 64), from British Somaliland; Lord Rothschild, *Ithaginis clarkei* (p. 67), from Yunnan; E. C. Stuart Baker, *Anuropsis malaccensis saturata* (p. 68), N. Sarawak; and C. Chubb, *Pachyrhamphus macconnelli* (p. 73), Bonasika River, British Guiana; *P. albiloris* (p. 73), San Estahan, Venezuela; *P. chapmani* (p. 74), Antioquia Colombia; *P. costaricensis* (p. 74), Bebedero, Costa Rica; and *Empidonomus varius parvirostris* (p. 75), Kamakabra River, British Guiana. G. M. Mathews also proposes seven new forms from Australia.

British Birds. XIII, No. 7. December 1, 1919.

Notes on the Migration of Birds over the Mediterranean Sea. By C. Sufferin.

The Birds of Bardsey Island. By N. F. Ticehurst. Part V.

British Birds. XIII, No. 8. January 1, 1920.

Nesting Habits of the Merlin in Glamorganshire. By G. C. S. Ingram.

The Oystercatcher's Progress towards Maturity. By J. M. Dewar.—A study of the habits and development of nineteen families of these interesting birds from the day of hatching (eight a little later) up to the 23rd and 35th day. A most interesting and important study in behavior. One cannot but think how many nests of the American Oystercatcher have been found and all we have to show are the empty shells of a lot of eggs. Comparatively few "oologists" have any conception of what constitutes the science of ornithology.

British Birds. XIII, No. 9. February, 1920.

On the Nesting of the Storm Petrel. By Audrey Gordon.—On the Inner Hebrides.

British Birds "Marking Scheme." Progress for 1919. By H. F. Witherby. The total number of birds "ringed" now numbers over 91,000 for the eleven years. A list of interesting recoveries is appended to the report.

The Avicultural Magazine. X, No. 14. December, 1919.

Bird Photography at the Zoo. By W. S. Berridge.—With an excellent picture of the Greater Bird of Paradise in display.

The Breeding of My Kagus, All but—. By an Old Australian Bird-Lover.—Interesting notes upon these curious birds in captivity. The unfortunate modesty of the author in concealing his identity prevents others who may be interested from getting in touch with him.

Notes on the Birds of the Balearic Islands. By Philip Gosse. (Continued in January number.)

The Color Question. By an Old Australian Bird-Lover.—Experience and pertinent suggestions as to the effect of food on color.

The Avicultural Magazine. XI, No. 1. January, 1920.

The Mantchurian Crane. By W. H. St. Quintin.

The Emu. XIX, Part III. January, 1920.

Notes on Sea Birds. By W. Macgillivray.—Observations from a troop ship to and from England.

Nesting of the White-rumped Swift (*Cypselus pacificus*). By H. L. Cochrane.

Material for a Study of the Megapodidae. By R. W. Shufeldt. Part III. Addenda.—Treats of *Megacephalon maleo* with a colored plate of the head and neck and half-tones of the eggs and skeleton.

Annual Report of the R. A. O. U. and of the Bunya Range Excursion. By A. H. Chisholm; and a list of the birds observed by S. A. White and J. B. Cleland.

South Australian Ornithologist. IV, Part 4. October 1, 1919.

The Weights of Some Australian Birds. By A. M. Morgan.—Birds lose weight rather rapidly after death. Many weights of eggs and their relation to the bird's weight are also given.

Morning Bird Calls. By J. Sutton. Time of morning song during August.

Birds Recorded from the Early Days Up to the Present Time for the Reed Beds District. By S. A. White.

The Austral Avian Record. III, No. 7. December 3, 1919.

Devoted entirely to biographical sketches, with portraits, of the three Australian ornithologists, S. A. White, T. Carter, and W. D. K. Macgillivray. All by Mr. Mathews.

Revue Francaise d'Ornithologie. XI, No. 126–127. October–November, 1919. [In French.]

Inquiry on the Disappearance of the Sparrow. By A. Menegaux.

The Distribution of the Penguins and Its Geological Interpretation. By M. Boubier.

Legends, Prejudices and Emblems Relating to Birds. By F. Cathelin. (Continued in later numbers, to Part 130.)

Revue Francaise d'Ornithologie. XI, No. 128. December, 1919.

On the Protection of Birds in the Province of Quebec. By F. Gaguin.

Revue Francaise d'Ornithologie. XII, No. 129. January, 1920.

An Amateur Bird Guide for One Visiting Africa. By Dr. Millet-Horsin. (Continued.)

Observations on the Song of Birds in Winter. By J. Berlioz.

Der Ornithologische Beobachter. XVII, No. 2. November, 1919. [In French and German.]

A Contribution to the Avifauna of Binntal (Wallis). By A. Hess. (Continued in Nos. 3 and 4.)

Ornithological Notes from the Region of the Bosphorus. By A. Mathey-Dupraz.

Der Ornithologische Beobachter. XVII, No. 4. January, 1920.

The Summer Life of the Starling. By H. Fischer-Sigwart.

Le Gerfaut. 5–9 Ann. Fasc. I, 1919. [In French.]

This is the first issue since the German occupation of Belgium in August, 1914, as explained in a note to the readers, from which we also learn that the treasurer of the Belgian Ornithological Society was murdered by the Germans at Louvain while the secretary fell on the field of battle at Voltin. The publication, however, starts out again with renewed energy and four issues appeared in 1919.

Biographical Sketch of Alfred Sacre.

Fauna of Belgium. *Buteo buteo zimmermannae.* By G. van Havre.

An American Bird New to the Fauna of Belgium. By M. de Contreras.—*Larus fuliginosus.*

Le Gerfaut. 5–9 Ann. Fasc. II, 1919.

Ornithological Observations from 1914–1918 at Wyneghem. By G. van Havre.

Remarks on the Life of the Cuckoo. By M. Mairlot.

Birds and the War. Migration in the Eastern Region. By L. Coopman. (Continued.)

Fauna of Belgium. *Cinclus cinclus cinclus.* By G. van Havre.

The Food of the Starling. By A. Mercier.—Mainly from Collinge's paper.

Le Gerfaut. 5–9 Ann. Fasc. III, 1919.

The Red-throated Pipit. *Anthus cervinus.* By L. Coopman.

The Yellow Bunting. *Emberiza citrinella citrinella.* By M. Mairlot.

Habits of the Cuckoo. By A. Paque.

Le Gerfaut. 5–9 Ann. Fasc. IV, 1919.

Brunnich's Murre in Belgium. By C. Dupond.—Specimen proves to be *Alca torda.*

Ornithologische Monatsberichte. Vol. 23, No. 9. September, 1915. [In German.]

We have before us this complete set to the end of 1916. The principal papers are listed below with all new forms.

On the Migration of Gannets into German Binnen Land. By H. Schalow.

Ornithologische Monatsberichte. Vol. 23, No. 10. October, 1915.

New Species. By Reichenow. *Tanagra ehrenreichi* (p. 154) Hyntanaham, on the upper Purus; regarded as probably a race of *T. coelestis; Anthus leucocraspedon* (p. 155), Wendhuh, S. W. Africa. No type specimens mentioned as is unfortunately the custom of this author.

The Geographical Forms of *Corythornis.* By O. Neumann.—Recognizes four: *C. c. cristata,* Madagascar and Comoren Island; *C. c. galerita,* tropical Africa; *C. c. nais,* Prince's Island; *C. c. thomensis,* St. Thomas.

Ornithologische Monatsberichte. Vol. 23, No. 11. November, 1915.

Nomenclatural Remarks on the Genus *Alcedo* Linn. By A. Laubmann.

Ornithologische Monatsberichte. Vol. 23, No. 12. December, 1915.

Birds of Northern France. By H. Boeker.

New Tropical Birds. By O. Neumann.—*Paleornis krameri borealis* (p. 178) Assam; *Chalcopsittacus duyvenbodei syringanuchalis* (p. 179) Stephansort, New Guinea; *Opopsitta nigrifrons ramuensis* (p. 180), Bismark Mts., New Guinea; *Tanysiptera nigriceps leucura* (p. 180), Rook Island, near New Guinea; *Pitta brachyura beryllofulgens* (p. 181), a specimen bought in Calcutta; *Graucalus caledonicus thilenii* (p. 181), New Hebrides; *Graucalus macei andamanus* (p. 181), *Chaetura ussheri senegalensis* (p. 182), Thies, Senegal.

Ornithologische Monatsberichte. Vol. 24, No. 1. January, 1916.

Nomenclatural Remarks on the Genus *Alcedo* Linn. By A. Laubmann. (Continued.)

Wasp Enemies Among Birds. By E. Hesse.

Ornithologische Monatsberichte. Vol. 24, No. 2. February, 1916.

Ornithological Observations in Husum (Germany). By W. Hagan.

New Birds from Siam. By N. Gyldenstolpe.—*Alseonax siamensis* (p. 27), Bang Hue Pong, N. Siam; *Gerygone griseus* (p. 27), Koh Lak, Siamese Malakka; *Turdus aureus angustirostris* (p. 28), Koon Tan, N. Siam; *Lanius hypoleucus siamensis* (p. 28), Koh Lak; *Picus vittatus eisenhoferi* (p. 28), Pa Hing, N. Siam; *P. canus hessei* (p. 28), *Brachylophus chlorolophoides* (p. 29), Koon Tan, N. Siam; *Sphenocercus pseudo-crocopus* (p. 29), Bang Hue Pong, N. Siam.

Ornithologische Monatsberichte. Vol. 24, No. 3. March, 1916.

On the date of publication of Pallas' 'Zoographia Rosso-Asiatica.' By E. Hesse.—Date of 1811 as printed on the title page is endorsed.

Ornithologische Monatsberichte. Vol. 24, No. 4. April, 1916.

New Forms from Africa. H. Freiher Geyr von Schweppenberg.—*Pterocles lichtensteini targius* (p. 56), Quelle Tahart; *P. l. abessinicus* (p. 57), Dire Daura; *Columba livia targia* (p. 58), Ain Tahart; *Turtur t. hoggara* (p. 59), Ideles am Nordrande, Hoggar Plateau; *Cotyle rupestris spatzi* (p. 59), Gara Djenoun.

On Rhynochetos. By Reichenow.—Account of the structure of the Kagu with cut of the bill and nostril.

On the Name *Columba pallida* Lath. By E. Hesse.

Ornithologische Monatsberichte. Vol. 24, No. 10. October, 1916.

New Species. By Reichenow.—*Cinnyris schillingsi* (p. 154), Kilimanjaro; *Sylvietta carnapi dilutior* (p. 154), Ruwenzori; *Certhia brachydactyla lusitanica* (p. 154), and *Parus ater lusitanica* (p. 154), both from Oporto, Portugal; *P. brunnescens* (p. 154), Kubub in Namaland; *Carpospiza brachydactyla psammochura* (p. 155), Kousha, Beluchistan.

Ornithologische Monatsberichte. Vol. 24, No. 11. November, 1916.

Lagonosticta rhodopareia neglecta (p. 168), Portuguese Guinea; *Estrilda astrild niediecki* (p. 168), Nanneala, Rhodesia; *E. a. adesma* (p. 168), Kissenji, Kiwusee; *E. incana hapalochroa* (p. 168), *Pseudospermestes microrhyncha* (p. 168), West side of Victoria Nyanza; *Munia calaminoros* (p. 169), New Guinea; *Parus palustris balticus* (p. 169), Bialowies.

Ornithologische Monatsberichte. Vol. 24, No. 12. December, 1916.

New African Pycnonotidae. By Reichenow.—*Bleda notata pallidior* (p. 180), Loango; *Phyllastrophus zenkeri* (p. 180), and *P. albigularis adametzi* (p. 181), both from Camaroons; *P. placidus munzneri* (p. 181), Munzner, Mahenge; *Andropadus gracilirostris congensis* (p. 181), Leopoldsville, Congo; *Pycnonotus xanthopygus palaestinae* (p. 181), Jafa, S. Palestine.

Journal für Ornithologie. Vol. 63, No. 4. October, 1915. [In German.]

Characters of the Flight-Feathers of the Birds of N. W. Germany. By H. Reichling.

Hans Graf von Berlepsch. By C. E. Helmayr.—Portrait and bibliography of 84 titles.

Some Noteworthy Records of German Birds in the Royal Zoological Museum at Berlin. By E. Hesse.

Journal für Ornithologie. Vol. 64, No. 1. January, 1916.

South Somaliland as a Zoogeographical Province. By O. Graf Sedlitz. (Continued.)—The following are proposed as new, all from Afgoi: *Oriolus larvatus reichenowi* (p. 1); *Gymnoris pyrgita reichenowi* (p. 42); *Serinus dorsostriatus harterti* (p. 47), *Anthreptes longmari neumanni* (p. 73); *Apalis flavida neumanni* (p. 89); *Cichladusa guttata mulleri* (p. 108).

A Contribution to the Avifauna of Hesse Nassau. By W. Hagan.

Materials for a Revision of the Genus *Campephaga* Vieill. By O. Neumann.—Seven forms and several "aberrations" are listed.

Journal für Ornithologie. Vol. 64, No. 2. April, 1916.

A Contribution to Our Knowledge of the Ornithology of Saxony. By R. Heyder. (Continued.)—This instalment contains a bibliography of 415 titles and enumerates 62 species.

On the Elevations to Which Birds Range. By H. Krohn.—A miscellaneous compilation.

Remarks on Some Forms of Sylviidae. By E. Hesse.—*Hippolais pallida* and *caligata* and *Calamoherpe brehmii*.

Journal für Ornithologie. Vol. 64, No. 3. July, 1916.

A New Catalogue of the Birds of Germany. By E. Hesse and A. Reichenow.—Nomina conservanda are recognized, and the International Code is ignored.

War Observations in Belgium and France. By J. Gengler.

Journal für Ornithologie. Vol. 64, No. 4. October, 1916.

Report on Ornithological Observations at Rossiten for 1915. By J. Thinemann.

Remarks on Some Turkestan Birds. By P. Kollibay.

Ardea. VIII, No. 2. November, 1919. [In Dutch.]

Dr. Coenraad Kerbert. Obituary with Portrait.

Arrival of Certain Migrant Birds in Holland in 1918. By H. Ekama.

Migration of the Swift (*Apus apus*). By A. E. H. Swaen.

Condition of the Cormorant Colonies in Holland. By G. J. Van Oordt.

Communication on the Breeding Birds of Holland. By T. de Vries.

Ornithological Articles in Other Journals.[1]

Shufeldt, R. W. Osteological and Other Notes on the Monkey-eating Eagle of the Philippines, *Pithecophaga jefferyi* Grant. (Philipp. Jour. Sci., XV, No. 1. July, 1919.)—Eleven plates from photographs of the skeleton of this and other species.

Criddle, Norman. Birds in Relation to Sunflower Growing in Manitoba. (Canadian Field Naturalist, November, 1919.)

Oberholser, H. C. A New Cliff Swallow from Canada. (Ibid)—*Petrochelidon albifrons hypopolia* (p. 95), Fort Norman, Mackenzie. Ranges from central Alaska over western British America to Alberta and Montana.

Fleming, J. H. Birds of Northern Saskatchewan and Northern Manitoba Collected in 1914 by Capt. Angus Buchanan. (*Ibid.* December, 1919.)

Stephens, T. C. Records of the Past Winter (1917–1918) in the Upper Missouri Valley. (Proc. Iowa Acad. Sciences, XXV, pp. 71–83. 1919.)

Stephens, T. C. Birds of Union County, South Dakota. (*Ibid.* pp. 85–104.)

Gabrielson, Ira N. A List of the Birds Found in Marshall County, Iowa. (*Ibid.* pp. 123–153.)

Allen, A. A. Illustrated Articles on the Gulls and Terns; Rails, Coots and Gallinules; Herons; Loons and Grebes. (American Forestry, XXV, pp. 1291, 1000, 1229, 1419.)

Gates, Moody B. Protecting Birds as an Act of Patriotism. (*Ibid.* p. 1063.)

Wetmore, Alexander. Description of a Whippoorwill from Porto Rico. (Proc. Biol. Soc. Washington, 32, pp. 235–238. December 31, 1919.)—*Setochalcis noctitherus* (p. 235).

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[1] Some of these journals are received in exchange, others are examined in the library of the Academy of Natural Sciences of Philadelphia. The Editor is under obligations to Mr. J. A. G. Rehn for a list of ornithological articles contained in the accessions to the library from week to week.

Harper, Francis. A New Subspecies of *Prunella modularis* from the Pyrenees. (*Ibid.* pp. 243–244, December 31, 1919.)—*P. m. mabbotti* (p. 243), Saillagouse, France.

Wetmore, Alexander. A Note on the Eye of the Black Skimmer (*Rynchops nigra*). (*Ibid.* p. 195, December 31, 1919.)—The pupil was found to contract in sunlight to a narrow vertical slit as in the eye of the cat, a peculiarity unique among birds in the experience of the writer.

Lincoln, F. C. Some Notes on the Plumage of the Male Florida Red-wing (*Agelaius p. floridanus*). (*Ibid.* p. 196, December 31, 1919.) Apparently adult birds but with undeveloped sexual organs had the red shoulder patches very poorly developed and the general appearance of the plumage dull.

Swales, B. H. A Former Record of the Heath Hen (*Tympanuchus cupido*) at Washington, D. C. (*Ibid.* p. 198, December 31, 1919.)—Based wholly upon an entry by Prof. Baird of a specimen, since destroyed, recorded as secured at Washington, April 10, 1846, by Dr. Alex. McWilliams.

Oberholser, H. C. *Pagophila eburnea* versus *Pagophila alba*. (*Ibid.* p. 199, December 31, 1919.)—Upholds the applicability of *Larus albus* Gunnerus.

Oberholser, H. C. The Status of the Genus *Asarcia* Sharpe. (*Ibid.* p. 200, December 31, 1919.)—Regards it as a full genus instead as a subgenus of *Jacana* as usually held.

Oberholser, H. C. The Names of the Subfamilies of Scolopacidae. (*Ibid.* p. 200, December 31, 1919.)—Agrees with Lowe as to the recognition of three subfamilies but would change the names of them to Scolopacinae, Canutinae and Numeniinae.

Oberholser, H. C. Notes on the Names of *Halobaena caerulea* and *Prion vittatus*. (*Ibid.* p. 201, December 31, 1919.)—Differs from Mathews in regarding Forster's *Procellaria vittata* as a tenable name for the "Blue Petrel," which therefore becomes *Halobaena vittata*. This of course precludes the use of Gmelin's *Procellaria vittata* of later date, for the Prion which must become *Prion forsteri*.

Oberholser, H. C. Mutanda Ornithologica. VIII. (*Ibid.* pp. 239–240, December 31, 1919.)—*Turdus sordidus* Müller being an older name for *Pitta atricapilla*, it must become *P. sordida*. *Riparia paludicola sinensis* being preoccupied becomes *R. p. chinensis* (Gray). *Stoparola melanops* for the same reason becomes *S. thalassina* (Sw.), while *Hemipus obscurus* becomes *H. hirundinaceus* (Temm.) and *Tachyphonus rufiventris* will be known as *T. metallactus* nom. nov. (p. 240).

Ober, E. H. The Life History of the Sage Hen. (California Fish and Game, January, 1920.)

Gunthorp, Horace. Bird Collections for Colleges and High Schools. (School and Society, VII, May 1918).—Suggests the use of colored pictures of birds for seasonal exhibits of birds present at a given locality as a substitute for a collection of the birds themselves.

McAtee, W. L. Good Birds and Bad Birds. (Twenty-first Biennial Rept. Kansas State Board of Agriculture, 1917–18.)—Published 1919. An excellent resume of the subject of economic ornithology.

Krum, Olin C. The Progress of Wild Life Conservation Work at Cornell. (Bull. Amer. Game Protect. Asso., October, 1919.)—A most interesting illustrated account.

LaDue, H. J. The Protection of Winter Birds. (*Ibid.*)—Admirable suggestions on this matter.

Holland, R. P. Federal Government to the Rescue of the Egrets. (*Ibid.*)—Describes the seizure of egrets in the hands of wholesale milliners and plume hunters in Florida and calls the attention of women to the fact that they are now liable to prosecution if they appear on the street wearing egrets.

Holland, R. P. Egg Destroying Vermin. (*Ibid.*, January, 1920.) Calls attention to the attitude of all game-keepers against all hawks as well as various gulls and other birds which destroy eggs. The breeding of game of course creates abnormal conditions on the breeding grounds and attracts predaceous animals. The outlawing of all of the latter regardless of what their original character may have been is the next step. At every move, however, we are further upsetting the balance of nature. Where it will eventually land us it is difficult to say.

Brownell, L. W. Getting Acquainted. (Blue Bird, XII, 1919–1920.) A series of illustrated accounts of our familiar birds.

Bowen, Georgia M. The Way of the Protectionist. (*Ibid.*) A serial on the history and method of bird protection.

Bowles, J. Hooper. Nesting Habits of the Cowbird. (The Oologists' Exchange and Mart, November, 1919.)

DeBeaufort, L. F., and DeBussy, L. P. Birds of the East Coast of Sumatra. (Bijd. tot. de Dierkunde, XXI, pp. 229–276.)—List of 282 species, with annotations and a map. None new. [In Dutch.]

Virchow, Hans. The Possible Movements of the Vertebral Column of the Flamingo. (Archiv. für Anatomie und Physiologie, IV, pp. 245–254. 1916.) [In Dutch.]

Currie, C. C. Birds of a Gippsland Garden. (Victorian Naturalist, XXXVI, No. 6, October, 1919.)—Popular account of familiar Australian birds.

Gillespie, T. H. The Breeding of the King Penguin. (Nature, CIV, p. 314, November 20, 1919.)—This describes the breeding in the Zoological Garden at Edinburgh of birds received in 1914 and 1917 from South Georgia Island. An egg laid September 1 hatched October 24 (7 weeks and 4 days). The young was small and the skin bare, but it grew rapidly. It was kept at first between the parent's feet and covered by the skin fold as was the egg. It was fed on disgorged, partly digested fish.

Ochoterena, Isaac. The Geographic-Botanic Regions of Mexico. (Boletin Soc. Mex. Geogr. y. Estadist., VIII, part 2, 1919.)—Considers animals also. [In Spanish.]

Oberholser, H. C. An All-day Bird Trip at Washington, D. C. (Amer. Midl. Nat., VI, pp. 103–110, 1919.)

Duerden, J. E. New Adaptive Callosity in the Ostrich. (Records Albany Museums, Africa, III, No. 3, September 30, 1919, pp. 190–195.) A median ankle callosity has apparently become hereditary while an accessory one has not.

Philpott, Alfred. Notes on the Birds of Southwestern Otago. (Trans. and Proc. New Zealand Institute, LI, September, 1919, pp. 216–224.) Thirty species listed.

Duerden, J. E. Breeding Experiments with the North African and South African Ostriches. V. Crossing the N. and S. African Ostriches. (Bull. No. 3, Dept. Agric. Union of South Africa, 1919.)—One hundred hybrids have been raised and two chicks of the second hybrid generation have now been reared.

Bond, C. J. On Certain Factors Concerned in the Production of Eye Colors in Birds. (Jour. of Genetics, December, 1919, pp. 69–81.)

Pearson, K., and Others. On the Nest and Eggs of the Common Tern (*S. fluviatilis*). A Coöperative Study. (Biometrika, XII, Part III–IV, November, 1919, pp. 308–354.)—Mathematical relationship between dimensions and coloration of eggs and structural characters of nests. Some admirable photographs of the birds are presented in illustration.

Rollinat, R. Breeding of the Eagle Owl in Captivity. (Bull. Soc. Nat. d'Acclimat. de France, Year 67, No. 10–11, October–November, 1919.) [In French.]

Bartels, M. On Some Birds New to Java. (Treubia. Recuil de Travaux. Zool. Hydrobiol. et Oceaogr., August, 1919, I, Pt. 2, Batavia, pp. 51–52.) [In German.]—*Accipiter gularis, Eurystomus calonyx, Porzana pusilla, Tringa canutus, Sula longipennis, S. sula.*

Oudemans, A. C. Dodo Studies. (Verhandl. der Kon. Akad. Wetenshap. Amsterdam, XIX, No. 4, June, 1917.)—An elaborate historical account of the Dodo and its allies, with bibliographies and lists of published illustrations, many of which are reproduced. The species are given as *Raphus cucullatus* Linn., *Apterornis solitarius* Selys., and *Pezophaps solitarius* Gm. [In Dutch.]

Schouteden, H. Contribution to the Ornithological Fauna of the Lower Congo. (Rev. Zool. Afracaine, VII, No. 2, October 1, 1919, pp. 188–192.) Forty species listed.—[In French.]

Hahn, Erna. On Color Perception of Diurnal Birds and the Oil Gland of the Eye. (Zeitschr. Wissen. Zool., CXVI, I, pp. 1–42.) [In German.]—Considers that the secretion of colored oils in the eyes of different species affects the extent of their color perception.

Noll-Tobler, H. Remarks on Our Native Rails. (Jahrb. St. Gallischen Naturw. Gesell., 54, pp. 209–245, 5 plates.) [In German.] An excellent account of the breeding of the Rails of Central Europe, with admirable photographic reproductions.

Duerden, J. E. Methods of Degeneration in the Ostrich. (Jour. of Genetics, IX, No. 2, pp. 131–193, Plates V–VI.)

Soderberg, Rudolf. Results of Dr. E. Mjoberg's Swedish Scientific Expeditions to Australia, 1910–1913, XIII. Studies of the Birds in Northwest Australia. (Kungl. Svensk. Vetensk. Handl., 52, No. 17, pp. 3–116, pl. I–IV, 1918.)—An extended report with many text figures. No new forms are described. [In English.]

Kruimel, J. H. Investigations on the Feathers of Gall naceous Birds. (Bijd. tot. de Dierkunde Amsterdam, XX, pt. 2, pp. 1–93, pl. I–IV, 1916.) An exhaustive study of structure, coloration, etc. [In Dutch.]

Thysse, J. P. On Bird Song. (*Ibid.* XXI, pp. 119–122.) [In Dutch.]

Portielje, A. F. J. Biological Observations in the Garden of the Royal Zoological Society. (*Ibid.* XXI, pp. 137–144, pl. III.)—Downy young of *Ardea goliath*, *Pseudogeranus leucanchen* and *Catharista* are shown with their parents in the plate. [In Dutch.]

Additional Publications Received.—Richmond, C. W. In Memorium. Edgar Alexander Mearns. Smithsonian Report for 1917. Reprinted from 'The Auk,'

American Bird House Journal. J. W. Jacobs, Waynesburg, Pa. IV, No. 1, January, 1919.

Bird Notes and News. VIII, No. 8. Winter, 1919.

Bulletin of the Charleston Museum. XV, No. 8, and XVI, No. 1. December, 1919, and January, 1920.

Fins Feathers and Fur. No. 20, December, 1919.

Florida Audubon Bulletin. Florida Audubon Society, Winter Park, Fla. I, No. 3. October, 1919.

New Jersey Audubon Society. Ninth Annual Report. October, 1919.

Scottish Naturalist. Nos. 95–96. November–December, 1919.

Philippine Journal of Science. XIV, Nos. 5 and 6, and XV, Nos. 1 and 2. May–August, 1919.

Records of the Australian Museum. XII, No. 12. December, 1919.

CORRESPONDENCE

An "Occult Food Sense" in Birds.

EDITOR OF 'THE AUK':

Articles dealing with the subject of instincts or intelligence in birds or in mammals have for me a peculiar fascination and are read with much interest. Mr. Beck's article in 'The Auk,' on 'The occult senses in birds,' proved no exception.

The scene pictured by the author was vividly visualized as I continued to read the well written lines. The crisp morning, the music of the speeding hounds, the tingle of eagerness and the keen expectation of the early hunters—then the puzzling change in the whole scene and the end of a stirring fox chase in the prosaic killing of a mad dog.

But with mind absorbed in the captivating account I am still dimly conscious of another scene, which persists in intruding upon the first. High overhead, on motionless wing, soar two black birds, mere specks in the uncertain light. Greater vision would have revealed them as vultures keenly intent upon the drama below, all-hearing, all-observing; but they themselves unobserved, unheard. When the last echo of the gun and the last whimper of disappointed hound and the last sound of human voice had passed away, and all was silent and restored to its wonted order, they began to descend. Rapidly, as they drew near the earth, their sharp eyes and tenacious avian memories which so often before had unerringly guided them on similar missions, led them now into close proximity of the very spot where that something had taken place, which merited their searching investigation. In a time that was incredibly short from the human viewpoint their marvelous eyesight, assisted now by—yes, by a degree of smelling power and also by a "resourcefulness" peculiar to such as are accustomed to seek the necessities of life in many different situations—they soon found themselves before the banquet hall, or, more precisely, the banquet hole.

It may be, however, that after all it was not these particular two birds, for the mental picture is more or less blurred and obscured by a second one, of a pair of vultures soaring above the South Mountain, taking their morning constitutional in sweeping circles that measured their radii—I had almost said in miles—who caught the sound of hound and gun on the still morning air, and "understood."

Now, the whole point I wish to make by all this rambling is, merely, that it seems to me quite unnecessary to call forth an "occult food sense" in order to explain the phenomenon described by the author of the above mentioned article. On the evidence there presented it is not at all clear that the case can not be explained by the operation of senses that are

well known and are possessed by birds as well as by most other animals. While the author, in his analysis of the case, has apparently to his own satisfaction eliminated the question of sight and of smell, he seems to have overlooked the application of a third highly developed faculty, that of hearing, to which reference had already been made, in a general way, in his first paragraph.

One need look no further, it seems to me, than to the remarkably developed functions of sight and hearing in order to arrive at a tenable explanation of the first essential and striking phase of the observation made by Mr. Beck, namely, the coming of the vultures so soon and apparently from nowhere, to the scene of action. The hunters, intent upon the chase, had no thought, most likely, for such things as vultures which even at the very time may have been within the range of the men's vision, or, if not, were at no greater distance than was well within the limits of their own superior senses. Whether seen or heard by the birds the action below was beyond doubt sufficient to bring them nearer the scene, for to respond to such and similar stimuli, signals if you please, we may well believe is a function of their inherited instincts.

And what reason have we to believe that to their well attuned ears the sound of "the voices of the hounds on the twisted night track" was not audible, even from their aerial pathway above the South Mountain? It has been shown, I believe, if my memory serves me aright, from experiments in acoustics, that the voice of the dog possesses a remarkable carrying quality, perhaps greater than that of any other domestic animal, and that it is the last animal sound that the aviator hears in ascending to a great height. It may safely be assumed, therefore, that to certain birds, especially such as the vultures and other birds of prey, the sound is audible to a very much greater distance than we ourselves are able to appreciate, with our limited powers.

Having in the first phases of the phenomenon been directed by either the auditory or the visual sense, or for that matter by both, after having reached the ground it may with sound reason be presumed that a little search, their sharp eyes now ably assisted by some degree of olfactory sense, would soon reveal the object of their quest. The time element, which was three hours or more, seems to me entirely adequate, even should the birds have come all the way from their roosting place on the slope of South Mountain.

As to the analogies drawn by the author from insect life, with respect to a "mating sense," the evidence brought forward seems, in my humble opinion, entirely to lack force even in a "contributive" way, so far as it suggests the existence of a sense different in kind from those which are well known to be present in insects and which have been scientifically proved beyond peradventure. The olfactory sense, if I mistake not, is generally recognized by entomologists as the dominant sense among insects. The degree of refinement it here attains and its "differentiative

capacity" are alike of an order difficult for man to appreciate. But so far as known the difference is one rather of degree than of kind. Applied to the case of the wasp, *Pelecinus*, is not the established olfactory sense sufficient to explain how the elusive males can find the females, thus being drawn forth from their retirement, probably from no such great distances as we may sometimes be led to imagine, and revealing themselves to the comparatively dull visual faculties of the naturalist? Every hunter has experienced a parallel case, hardly less striking, in the magical appearance of swarms of blowflies which arrive to "inspect" his game almost as soon as it is dead. It cannot be seriously questioned, I believe, that the highly refined olfactory sense is adequate to account for all this, and that it is the same in kind as that which brings the bear to the bait from afar and enables the dog to trail his master through the crowded street.

It is not the intention to deny the possible existence in animal life of other senses than the orthodox five that come within the pale of human experience; far from it. That the "homing sense" is a sixth one may well be true. When we shall have learned more about the functions of all parts of the internal ear and shall have added something more definite to our knowledge of what has been called "muscle sense," then this question may possibly be answered with a degree of assurance. While freely admitting the attractiveness and stimulating effect of formulating working hypotheses and theories, the point I wish to emphasize is simply that we should first of all exhaust the explanatory possibilities of the scientifically proven sense functions, in the analysis of observed phenomena where matters of this nature are involved, before proceeding to draw from the realm of the unknown. On the evidence adduced I feel that this procedure has not been followed in the case of the two vultures, and that the assumption of the existence of an "active sense which may be called 'occult'" even "simply because it is hidden from the experience and understanding of man," is not justified.

Charles Eugene Johnson.

Department of Zoology, University of Kansas.

The Search for Food by Birds.

Editor of 'The Auk':

The following remarks suggest interpretations that may be placed upon observations, different from those associated with them by Messrs. Beck and Grinnell in 'The Auk' for January, 1920 (pp. 55–59 and pp. 84–88). In the former article, an occult sense is invoked to account for Turkey Vultures finding the carcass of a mad dog thrown out of sight in a sinkhole by fox hunters. From evidence given in the article, there can be no certainty that the entire performance of killing the dog and throwing it in the hole was not watched by buzzards. Had some of the

birds been sailing overhead at a considerable height (a common habit), probably they would not have been seen by the hunters, yet every move of the latter might have been observed by the birds; the presence and actions of the pack of hounds would almost certainly have attracted the attention of any birds on the wing, even had they just left the supposed nearest roost, eight miles away. Furthermore the observations as reported do not exclude the possibility that the vultures were already in the hole where the carcass was thrown. Either of these suggestions seems easier to entertain than that the buzzards were guided to the carcass by a means outside of human experience.

Certainly in the classic experiments of John Bachman as reported by Audubon (Orn. Biogr., Vol. 2, 1835, pp. 44–49), both Turkey and Black Vultures, showed their absolute dependence for food-finding upon the sense of sight, and ignored food they would have found immediately had they been able to smell, much less had they been possessors of an "occult" food-finding faculty. Consider the following extract, "The most offensive portions of the offal were now placed on the earth; these were covered over by a thin canvass cloth; on this were strewed several pieces of fresh beef. The Vultures came, ate the flesh that was in sight, and although they were standing on a quantity beneath them, and although their bills were frequently within the eighth of an inch of this putrid matter, they did not discover it. We made a small rent in the canvass, and they at once discovered the flesh, and began to devour it. We drove them away, replaced the canvass with a piece that was entire; again they commenced eating the fresh pieces exhibited to their view, without discovering the hidden food they were trampling upon."

Dr. Grinnell's thesis is that certain call-notes may have been fixed by selection on account of their utility in preventing individual birds from seeking food in areas recently searched by another bird. His examples are the Ruby-crowned Kinglet and Audubon's Warbler. The eastern representative of the latter bird, the Myrtle Warbler, is similar in habits and has a very similar call-note. This is uttered frequently whether by the few warblers or perhaps single wintering bird in a given locality, or by the individuals of a perfect swarm of the warblers such as winter in coastwise parts of the Carolinas. In the former case risk of searching the same area twice practically does not exist; in the latter that the same area will be gone over more than once daily is inevitable. In either event the call-note cannot have the significance hypothecated by Dr. Grinnell.

In fact birds do habitually go over the same places. A tree infested by bark-beetles is not freed of its pests by continuous work on the part of woodpeckers; on the contrary they return to it again and again. Our feeding-stations with practically inexhaustible supplies are periodically visited, and tempting as they are, usually do not localize the birds. These have other business elsewhere, but they return. Many observations by the writer, confirmed by comparing notes with others, indicate that vari-

ous birds have more or less regular beats which they cover approximately on schedule. This means they do repeatedly go over the same trees; but in their territory they undoubtedly make excursions, for when we test them by exposing food supplies they quickly find them. Their system of food-finding, like that of various other animals (as ants and mice), is, I am convinced, to look everywhere in their domain. They have all their time for the work, and searching all day every day, in the comparatively restricted area, to which most birds at any given time, appear to confine themselves, it is inevitable that the same spots will be inspected again and again.

The appeal to theory when observed facts really have nothing particularly mysterious about them, seems to be due to taking too seriously the so-called "struggle for existence." Except at the breeding season, an individual bird has practically nothing to do but to search for food. Under anything like normal conditions there must be no great difficulty in securing the required amount. In fact in the case of Audubon's Warbler and numerous other birds of mixed feeding habits there is always available a reserve food supply, in the form of overwintering fruits, upon which the birds can draw at will. Such birds, therefore, distinctly are not under constant pressure of necessity of food-finding. They at least have leisure, though their actions may belie it. In the writer's opinion, all birds, normally, are not in dire straits for food. Of the smaller species, at least, I would say, they make countless unnecessary excursions, they peck a hundred times for each morsel of food secured, they are, they must, they will be busy. This ceaseless unproductive activity in itself is sufficient evidence that the struggle for existence is not the gripping, controlling thing some would believe.

In conclusion I would mention briefly certain other points in the two papers reviewed that seem rather too highly tinged by theory. The sense of direction, admittedly marvellously developed in certain birds, is not entirely occult to man. Australian natives and other savages have been recorded as having it in marked degree and civilized man certainly does not entirely lack it. The wonderful cases of male insects finding females immediately after issuance from their pupal cases certainly are more satisfactorily explicable on the basis of a finely developed tropic sensitivity than on an occult mate-finding sense. Results of experiments certainly support this view, since female moths emerging in indoor cages, as in greenhouses, have attracted numerous males, though the circumstances could not agree in the province of any mate-finding sense that would have developed under natural conditions. In other words, since greenhouses have never been part of the normal environment, an "occult" mate-finding sense developed by natural selection would not take male moths into such a structure. However, a very sensitive tropic reaction would take them there or to any other accessible place where the excitatory object, the female, happened to be.

With respect to Dr. Grinnell's note, it should be pointed out that in winter when the observations were made, insect life, for the most part, does not "move about again." Hibernating insects are relatively stationary and a considerable part of the insect food available to small birds at this season consists of the eggs and chrysalides of numerous insects, and adult scale insects, which do not change location at all. Furthermore, since there is no hard and fast line between non-flocking and flocking birds, any sequestration theory is bound to run counter, to the recognition-mark and related theories. Indeed, does it not appear that theories are best avoided? When facts accumulate sufficiently, their average tendencies, which we are in the habit of calling "natural laws," are apparent of themselves.

W. L. McAtee.

U. S. Biological Survey, Washington, D. C.

[In connection with the oft-quoted Bachman-Audubon experiment which Mr. McAtee once more falls back upon, why cannot some of our ornithologists in the Southern States, where Vultures abound, try this experiment over again? We are not usually willing to accept a statement of this sort without corroboration and why should we not have more light upon this matter?—Ed.]

Ridgway's Birds of North and Middle America, Vol. VIII.

Editor of 'The Auk':

In a monumental work such as Ridgway's 'Birds of North and Middle America,' errors are certain, however careful and competent the worker may be. Part VIII of that work has just been received and I hasten to indicate rather an unfortunate mistake so that correction may be at once undertaken.

On p. 608 appears "*Larus affinis* Reinhardt, Siberian Gull," and its only claim to inclusion in the work appears to be the record of the type described from "Nenortalik, Julianehaab, S. Greenland." I have shown that the type was not referable to the Siberian Gull so-called, but was a specimen of the form of *Larus fuscus* Linné which Lowe had separated under the name *L. f. britannicus*. This has been accepted by all British ornithologists and the entry in Ridgway's synonymy, p. 609, "*Larus fuscus affinis* Kennedy, Ibis, Jan. 1917, 31" refers to this fact and not to the "Siberian Gull." Consequently all the matter under the heading "*Larus affinis*" on pp. 608–609, save that dealing with Reinhardt's specimen and the one above quoted, must be eliminated as not pertinent to the American fauna. The essential references in confirmation read:

Lowe, British Birds (Witherby), Vol. VI, No. I, p. 2. June 1, 1912.

Lowe, Bull. Brit. Orn. Club, Vol. XXIX, p. 119. July 17, 1912.

Iredale, *Ibid.* XXXI, p. 68. March 29, 1913.

Iredale, British Birds (Witherby), Vol. VI, No. 12, p. 360. May 1, 1913.

Larus fuscus affinis, List Brit. Birds Comm. B. O. U., 2nd Ed., p. 255. 1915.

Ibid, British Birds (Witherby), Vol. IX, p. 10. 1915.

Another less important matter may be here attended to.

On p. 554, Ridgway has used "*Megalopterus minutus atlanticus*" for the Caribbean White-capped Noddy referring to Mathews, 'Birds of Australia,' Vol. II, pt. 4, Nov. 1, 1912, p. 423, but on that page Mathews proposed *Megalopterus minutus americanus* for the subspecies from the Caribbean Sea and British Honduras separating it from the bird from Ascension Island to which he gave the name used by Ridgway. As the name *americanus* has anteriority and was given to the American bird, it should have been used or the matter discussed, but the name is quite ignored. Just previously in his key on the same page, Ridgway defined a form from the Kermadec Islands calling it "*Megalopterus —?*" stating, "I am unable to place this bird." He also noted, "Owing to absence of specimens, I am unable to compare this [*M. m. atlanticus*] form with *M. m. minutus*." Mathews had included the Kermadec Island bird, which he figured and described, with the typical subspecies (from Torres Straits), but later in the 'Austral Avian Record,' Vol. III, No. 3, April 7, 1916, p. 55, has introduced for it the name *Megalopterus minutus kermadeci*.

It is displeasing to me to record such errors in such a magnificent work, but I am sorry to think that probably others may even occur as Ridgway has apologized for lack of first-hand reference to certain works, and there is evidence in the work itself of unverified references in other connections. On p. 797 it is written, "The remainder are names given by an anonymous author and therefore, according to my view, not eligible." On p. 308 he had utilized "*Calidus alba* (Pallas)" but the names in Vroeg's Catalogue must be accredited to Vroeg, otherwise the author is anonymous. "Tunstall's" names are barred also by absolute anonymity.

Tom T. Iredale.

39 Northwest Ave., Ealing, London, England,
Dec. 26, 1919.

NOTES AND NEWS

JAMES MELVILLE MACOUN, C. M. G., F. L. S., and chief of the Biological Division of the Geological Survey, Canada, died on January 8, 1920, aged fifty-seven. Mr. Macoun was best known as a botanist but had a wide acquaintance with ornithology and ornithologists and as joint author with his father, Prof. John Macoun, of the 1909 edition of the Catalogue of Canadian Birds, his death demands notice in the ornithological press.

Perhaps no one has had as much first hand experience in the less known areas of Canada—Lake Mistassini, James and Hudson Bay, the Churchill and Peace Rivers and Little Slave Lake were all scenes of intensive work by him and he was familiar with the more accessible parts of the Dominion under conditions of the past that will never return again.

One of the most important pieces of work conducted by him was on the Bering Sea Fur Seal Commission, which he conducted with so much satisfaction to his government as to win his decoration C. M. G. (Companion of St. Michael and St. George).

Of late years he did most of his work in British Columbia, and after completing his father's intensive surveys of two cross sections of that province along the lines of the southern railways he was just beginning another along the Grand Trunk Pacific to the north.

Death stayed his hand and work just at the height of his powers when years of preparation and ripening judgment made him most valuable to science, to the institution of which he was an honored member and to his country.

Besides a father and mother, a brother and sister, he is survived by his widow, one daughter, and a host of friends and sorrowing colleagues.—P. A. TAVERNER.

The following Fellows have been appointed by the President of the A. O. U. to constitute the Committee on Classification and Nomenclature of North American Birds for the year 1920: Witmer Stone, Chairman, Jonathan Dwight, Harry C. Oberholser, T. S. Palmer, and Charles W. Richmond.

The committee held a two days' session in Washington, D. C., February 11 and 12, 1920, and various general matters were discussed in regard to the method of work of the committee and the preparation of a new edition of the A. O. U. Check-List which should constitute the Nearctic volume of the proposed 'Systema Avium' to be gotten up by the B. O. U. and the A. O. U. jointly.

Dr. Oberholser was chosen Secretary of the Committee and many nomenclatural cases which had been considered by the sub-committee

of nomenclature of the old committee were formally passed upon while several new ones were decided. Altogether very satisfactory progress was made.

A case involving the constitutionality of the Migratory Bird Treaty Act, in which the law was sustained by the Federal Court for the Western District of Missouri, has been appealed to the Supreme Court of the United States by the State of Missouri and arguments were heard on March 2, 1920. This case, No. 609, is entitled The State of Missouri, appellant, vs. Ray P. Holland, United States Game Warden.

Two very important efforts toward the establishment and maintenance of bird reservations are now attracting much attention. First the drainage of Klamath Lake which threatens the destruction of this valuable reservation. According to the report of William L. Finley in the January issue of 'California Fish and Game,' the building of a dyke has already converted much of the lake into an alkali desert which the director of the reclamation service himself states is of no use for agriculture. Mr. Finley urges appeals to the Californian representatives in Congress while Mr. Pearson, in 'Bird-Lore,' suggests appeals to the Secretary of the Interior (cf. antea p. 318).

The other matter is the effort to have part of the Okefinokee swamp on the Georgia-Florida boundary established as a reservation. Timber rights and subleases seem to complicate this effort but much interest has been aroused. There is an excellent account of the enterprise in the Bulletin of the American Game Protective Association for October, 1919, by Dr. J. F. Wilson, Secretary of the Okefinokee Society, while the Biological Survey is also taking an active interest in the matter.

A modification in the Federal bird regulations has been made, allowing the killing of Grebes, Loons, Gulls, Terns, Mergansers, Bitterns, Great Blue, Little Blue, Green and Black-crowned Night Herons where these birds are injurious to and destructive of fishes at public or private fish hatcheries. The birds may only be killed or trapped by the owners, superindendents or bona fide employes of the hatcheries, and all portions of the birds must be entirely destroyed and not possessed, transported or shipped outside the grounds except that they may be presented to a public museum or educational institution.

There has been organized at Seattle, Washington, the Pacific Northwest Bird and Mammal Club which aims to promote social and fraternal relations among the working ornithologists and mammalogists of Washington, British Columbia, Alaska and northern Oregon. The officers for the current year are: President, F. S. Hall, Director of the State

Museum, Seattle; Vice-President, J. H. Bowles, Tacoma; Secretary and Treasurer, Stanton Warburton.

Coöperation is always productive of much good and it would seem that there is a good field in the northwest for just such an organization as this. We trust that those interested in joining the organization will lose no time in communicating with Mr. Hall, and we hope that the club may have a long and prosperous history.

COMPLETE SETS OF 'THE AUK.'—A series of 'THE AUK' now includes 36 full volumes accompanied by two general indexes for the years 1876–1900 and 1901–1910. Owing to the limited editions of the early volumes the number of possible complete sets probably does not exceed 500, but the total at present known is not much more than 150. Sales, destruction of copies, and the death of early members have broken the continuity of series and resulted in the transfer or loss of many volumes. As time goes on some sets now in private hands will pass into the possession of public libraries and the number of such sets now a little more than 60, will increase. Since the appearance of a brief note on this subject in 'THE AUK' for October, 1919, several members have reported the possession of sets and a few series previously incomplete have been completed. The data now available are published in the hope of stimulating further efforts in this direction.

In the following list arranged geographically by states, sets in public libraries are mentioned first and are followed in alphabetical order by those in private hands. Most of the sets are bound and nearly all include the two general indexes. Seven sets (indicated by an asterisk) are practically complete but lack a single volume or part of a volume. In addition to those here enumerated about 20 others are known which lack some of the first six volumes but which may be completed later. It is interesting to note that while these sets are distributed in 27 states, the Philippines, Canada, and England, less than one-fifth are located west of the Mississippi River. Nearly as many are credited to the District of Columbia while the only ones reported from the Southern States are one each in Virginia, South Carolina, Florida, and Texas.

Such a list as this is necessarily incomplete and subject to frequent correction as private sets change hands and gaps are filled in series now incomplete. Members are requested to send to the Secretary any corrections or additions which will increase the accuracy or completeness of the list.

CALIFORNIA—13

California Academy of Sciences, San Francisco
Leland Stanford, Jr., University, Palo Alto
Museum of History, Science and Art, Los Angeles
University of California, Berkeley
Dawson, W. L., Santa Barbara

Chambers, W. Lee, Eagle Rock, Los Angeles
Evermann, Dr. B. W., San Francisco
Fisher, Prof. W. K., Pacific Grove
Fowler, Capt. F. H., Palo Alto
Grinnell, Dr. Joseph, Berkeley
Mailliard, Joseph, San Francisco
Morcom, G. Frean, Berkeley
Stephens, Frank, San Diego

COLORADO

Coburn Library, Colorado College, Colorado Springs
Bergtold, Major W. H., Denver

CONNECTICUT

Pequot Library, Southport
Watkinson Library, Hartford
Yale University, New Haven
Bishop, Dr. Louis B., New Haven
Sage, John Hall, Portland
Seton, Ernest T., Greenwich

DISTRICT OF COLUMBIA—24

Library of Congress, Washington
U. S. Dept. Agriculture, Wash.
U. S. National Museum, Wash. (2)
Bailey, Vernon, Washington
Bartsch, Dr. Paul, Washington
Bond, Frank, Washington
Cooke, Miss M. T., Washington
Fisher, Dr. A. K., Washington
Fox, Dr. William H., Washington
Henshaw, H. W., Washington
Hollister, Ned, Washington
Howell, A. H., Washington
Knowlton, Dr. F. H., Washington
Merriam, Dr. C. Hart, Washington
Nelson, E. W., Washington
Oberholser, Dr. H. C., Washington
Palmer, Dr. T. S., Washington
Richmond, Dr. Chas. W., Wash.
Riley, Joseph H., Washington
Stejneger, Dr. Leonhard, Wash.
Swales, B. H., Washington
Wetmore, Dr. Alexander, Wash.
Williams, R. W., Washington

FLORIDA

Nehrling, H., Gotha

ILLINOIS

*Illinois State Laboratory of Natural History, Urbana
John Crerar Library, Chicago
Public Library, Chicago
Barnes, R. Magoon, Lacon
Coale, Henry K., Highland Park
Cory, Charles B., Chicago
Deane, Ruthven, Chicago
Gault, B. T., Chicago
Osgood, Dr. W. H., Chicago

INDIANA

Indiana State Library, Indianapolis
Butler, Amos W., Indianapolis

IOWA

Iowa State College, Ames
Stephens, Prof. T. C., Sioux City

KANSAS

State Library, Topeka

MAINE

Public Library, Portland
Merrill, Harry, Bangor
Norton, Arthur H., Portland

MARYLAND

Enoch Pratt Free Library, Baltimore
Kirkwood, Frank C., Monkton

MASSACHUSETTS—20

Boston Public Library
Boston Society of Natural History
Mass. Agricultural College, Amherst
Mass. State Library, Boston
Museum Comparative Zoology, Cambridge
New Bedford Public Library
Springfield Library Association
*Taunton Public Library
Thayer Museum, Lancaster
Wellesley College, Wellesley
Batchelder, Charles F., Cambridge
Bent, A. C., Taunton
Brewster Estate, William, Cambridge
Chamberlain, Chauncy W., Boston
Durfee, Owen, Fall River
Farley, John A., Malden
Jeffries, William A., Boston
Morris, Robert O., Springfield
Phillips, Dr. John C., Wenham
Tyler, Dr. Winsor M., Lexington

MICHIGAN

Detroit Public Library
Mich. Agricultural College, East Lansing
Wood, Norman A., Ann Arbor

MINNESOTA

Minnesota Athenaeum Library, Minneapolis
Roberts, Dr. Thomas S., Minneapolis

MISSOURI

Bolt, Benjamin F., Kansas City
Harris, Harry, Kansas City
Widmann, Otto, St. Louis

NEBRASKA

University of Nebraska, Lincoln
Dille, Frederick M., Valentine

NEW HAMPSHIRE

Levey, Mrs. William M., Alton Bay
White, Francis Beach, Concord

NEW JERSEY

Princeton University, Princeton
Bowdish, B. S., Demarest
Havemeyer, H. O., Mahwah
Rhoads, Samuel N., Haddonfield

NEW YORK—20

American Museum Natural History, New York
Brooklyn Museum
Brooklyn Public Library
Buffalo Public Library
*Columbia University, New York
Cornell University, Ithaca
Nat. Association Audubon Societies, New York
New York Public Library
N. Y. State College of Forestry, Syracuse
New York State Library, Albany
New York Zoological Park, New York
Vassar College, Poughkeepsie
Allen, Dr. J. A., New York (2)
Braislin, Dr. Wm. C., Brooklyn
Chapman, Dr. Frank M., New York
Dwight, Dr. Jonathan, New York
*Fuertes, L. A., Ithaca
Grinnell, Dr. Geo. Bird, New York
Herrick, Harold, New York
Pearson, T. Gilbert, New York

OHIO

*Adelbert College, Cleveland
Cincinnati Public Library
Cincinnati Society Natural History
Oberlin College, Oberlin
Ohio State University, Columbus

PENNSYLVANIA

Academy Natural Sciences, Philadelphia
Carnegie Library, Pittsburgh
Carnegie Museum, Pittsburgh
Burns, Frank L., Berwyn
Fisher, Miss Elizabeth W., Philadelphia
Norris, J. Parker, Jr., Philadelphia
Stone, Dr. Witmer, Philadelphia (2)

RHODE ISLAND

Flanagan, John H., Providence
Hathaway, Harry S., Providence

SOUTH CAROLINA

Wayne, Arthur T., Mt. Pleasant

TEXAS

University of Texas, Austin

VIRGINIA

*Public Library, Newport News

WASHINGTON

*Public Library, Seattle
Rathbun, Samuel F., Seattle

WISCONSIN

Milwaukee Public Museum

PHILIPPINE ISLANDS

Bureau of Science, Manila

CANADA

Geological Survey, Ottawa
Laval University, Quebec
McGill University, Montreal
Reference Library, Toronto
Arnold, Edward, Montreal
Fleming, James H., Toronto
Saunders, W. E., London
Taverner, Percy A., Ottawa

ENGLAND

British Museum Natural History, London
Zoological Society of London
Jourdain, F. R. C, Abingdon
Mathews, Gregory M.,Foulis Court, Fair Oak

T. S. PALMER.

Washington, D. C.

The fifth annual meeting of the Wilson Ornithological Club was held at St. Louis, Mo., in affiliation with the meeting of the American Association for the Advancement of Science, on December 29 and 30, 1919. Fifteen papers, many of them illustrated with lantern slides, were presented and contained much of interest. At the business session plans were laid for renewed activities after the comparative inaction of the war period and the following officers were elected: President, Dr. R. M. Strong; Vice-President, Dr. H. C. Oberholser; Secretary, A. F. Ganier; Treasurer, G. L. Fordice; Editor, Dr. Lynds Jones; Councillors, Dr. M. H. Swenk, Dr. B. R. Bales, and Dr. T. C. Stephens.

CORRECTION.—In the list of members of longest standing in the A. O. U., published in the January 'Auk,' Dr. William H. Fox, of Washington, D. C., was recorded as having been elected in 1885 instead of 1883. This unfortunate error originated in the earliest lists of members (Auk 1886 to 1890) from which our data were copied. Dr. Fox is therefore outranked only by the nine surviving founders of the Union.

ERRATA.—In the list of contributors to the Brewster Memorial Fund, printed in the January number of 'The Auk,' the names of Messrs. Chauncy W. Chamberlain and Thomas E. Penard were accidentally omitted. Dr. Edward Waldo Emerson appeared as "Edward M. Emerson," Mr. Howard P. Hottle as "Edward P. Hottle," and Mr. J. A. Hagar's name was spelled "Hager."